



DTIC FILE COPY

INTERNATIONAL

4

AD-A201 842

IEAL-R/86-55

**Energy and  
Environment  
Group**

THE PROSPECTIVE DURABILITY OF THE IAEA  
SAFEGUARDS SYSTEM AND FINANCING OF THE  
SYSTEM

FINAL  
MAIN REPORT  
VOLUME III

**PREPARED FOR:**

U. S. ARMS CONTROL AND DISARMAMENT AGENCY  
WASHINGTON, D. C. 20540

**PREPARED BY:**

INTERNATIONAL ENERGY ASSOCIATES LIMITED  
FAIRFAX, VIRGINIA 22030

DTIC  
ELECTE  
NOV 10 1988  
S H D

FEBRUARY 24, 1987

International Energy  
Associates Limited  
3211 Jermantown Road  
Fairfax, Virginia 22030  
(703) 246-0200

**DISTRIBUTION STATEMENT A**

Approved for public release  
Distribution Unlimited

88 11 10 004

<b>REPORT DOCUMENTATION PAGE</b>		1. REPORT NO. IEAL-R/86-55III	2.	3. Recipient's Accession No.	
4. Title and Subtitle The Prospective Durability of the IAEA Safeguards System and Financing of the System Volume III				5. Report Date February 24, 1987	
7. Author(s)				6.	
9. Performing Organization Name and Address International Energy Associates Limited 3211 Jermantown Road Fairfax, Virginia 22030				8. Performing Organization Rept. No.	
12. Sponsoring Organization Name and Address US Arms Control and Disarmament Agency 320 21st Street, NW Washington, DC 20451				10. Project/Task/Work Unit No.	
				11. Contract(C) or Grant(G) No. (C) AC4NC104 (G)	
				13. Type of Report & Period Covered Final	
15. Supplementary Notes				14.	
16. Abstract (Limit: 200 words) <p>The report identifies the major factors that will enhance the overall durability of the IAEA safeguards system or that could lead to its erosion; and addresses some of the worst case scenarios that conceivably could evolve in the IAEA and possibly compel countries to consider alternate verification mechanisms. Durability is largely an expression of political will on the part of nations to accord importance to, and to rely on, IAEA safeguards. It is related to the confidence that countries have in the IAEA to remain reasonably objective and credible and is a function of the extent to which countries are prepared to give the needed material, financial and political support. Three considerations, examined in the report, that can affect the durability of the IAEA system are: factors related to the internal workings of the safeguards system; factors that are external to the detailed operations of the IAEA itself; and factors relevant to whether any alternatives are practically available.</p>					
17. Document Analysis a. Descriptors <p>Inspection, (arms control) Nuclear materials management, (S)</p>					
b. Identifiers/Open-Ended Terms <p>IAEA Safeguards</p>					
c. COSATI Field/Group 0504, 1810, 1809					
18. Availability Statement: <p>Release unlimited</p>			19. Security Class (This Report) UNCLASSIFIED		21. No. of Pages 134
			20. Security Class (This Page) UNCLASSIFIED		22. Price

The Prospective Durability Of The IAEA  
Safeguards System And Financing Of The  
System

---

Final  
Main Report  
Volume III

---

Prepared For:

U.S. Arms Control And Disarmament Agency  
Washington, D.C. 20540

Prepared By:

International Energy Associates Limited  
Fairfax, Virginia 22030

February 24, 1987

This report was prepared by International Energy Associates Limited which is responsible for its contents. The views, judgments and recommendations in the report are those of the contractor and do not necessarily represent those of the U.S. Arms Control and Disarmament Agency.

## TABLE OF CONTENTS

1.0	INTRODUCTION	1-1
2.0	FACTORS FAVORING THE PRESERVATION OF THE IAEA SYSTEM	2-1
3.0	POTENTIAL CHALLENGES TO THE DURABILITY OF THE IAEA SYSTEM	3-1
3.1	POSSIBLE ADVERSE DEVELOPMENTS THAT ARE LARGELY ASSOCIATED WITH THE INTERNAL OPERATIONS OF THE IAEA ITSELF	3-3
3.1.1	Slow Death And Deterioration In The System	3-3
3.1.2	Failure To Keep Pace With The Workload	3-7
3.1.3	The Disaffection Of One Or More Significant Political Groups Or Factions Within The IAEA	3-8
3.1.4	Rapid Political Crisis - Including A U.S. Walkout	3-12
3.1.5	Refusal By Some States To Participate Further In The System	3-12
3.1.6	There Could Be An Apparent Serious Diversion Of Safeguarded Materials	3-14
3.1.7	Failure By The IAEA Governing Organizations And Member States To Respond Decisively To A Provocation	3-15
3.2	FACTORS AFFECTING "DURABILITY" THAT ARE LARGELY EXTRINSIC TO THE IAEA SAFEGUARDS SYSTEM ITSELF OR THAT ARE OUTSIDE OF THE IAEA'S CONTROL	3-18
3.2.1	Collapse Of The NPT	3-18
3.2.2	Military Attack Against An IAEA Safeguarded Facility	3-19
3.2.3	As A Function Of A Domestic U.S. Policy Shift The IAEA Could Be Judged By A Future U.S. Administration As Inherently Unable To Effectively Safeguard Some Kinds Of Important Technical Operations	3-20
3.2.4	Other Adverse Effects	3-21
4.0	THE CONSEQUENCES OF SOME REGRESSIVE DEVELOPMENTS	4-1
4.1	INTRODUCTION	4-1

For	
I	<input checked="" type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
by	
ty Codes	
and/or	
Initial	



A-1

# TABLE OF CONTENTS (continued)

4.2	SUCCESSSES ACHIEVED AT THE 1985 NPT REVIEW CONFERENCE AND 1985 IAEA GENERAL CONFERENCE	4-2
4.2.1	The Third NPT Review Conference	4-3
4.3	CONCLUSIONS AND MEANING OF THE REVIEW CONFERENCE	4-8
4.4	IAEA GENERAL CONFERENCE - SEPTEMBER, 1985	4-9
4.5	CONCLUSIONS	4-17
4.6	POSSIBLE CONSEQUENCES OF ANOTHER U. S. WITHDRAWAL FROM PARTICIPATION IN THE IAEA	4-22
5.0	ARE THERE CREDIBLE INSTITUTIONAL ALTERNATIVES TO IAEA SAFEGUARDS?	5-1
5.1	INTRODUCTION	5-1
5.2	FACTORS GOVERNING POSSIBLE DESIRABILITY AND FEASIBILITY OF ALTERNATIVES	5-2
5.3	TRIGGERING MECHANISMS	5-4
5.3.1	Withdrawal Of A State From IAEA Safeguards	5-4
5.3.2	Serious Deficiency In Resources Or Ability To Perform Selected Functions	5-5
5.3.3	Catastrophic Breakdown	5-5
5.3.4	Withdrawal By Some States From IAEA Safeguards	5-6
5.3.5	IAEA Lacks The Technical Or Material Resources To Adequately Safeguard A Major Program Including Some Major Sensitive Bulk-Handling Facilities	5-11
5.3.6	Probable Irreversible Breakdown In The IAEA System	5-15
5.4	REVIEW OF THE ALTERNATE SAFEGUARDS MECHANISMS - INCLUDING DESIRED ATTRIBUTES	5-16
5.4.1	The Major Options	5-16
5.4.2	Issues Associated With Reverting To U. S. Bilateral Rights	5-19
5.4.3	Concept Of Establishing New Multilateral Safeguards Arrangements	5-29

TABLE OF CONTENTS (continued)

6.0	USING REGIONALISM TO HELP SHARE THE SAFEGUARDS WORKLOAD OF THE IAEA	6-1
6.1	SOME OVERALL CONCLUSIONS ABOUT ALTERNATE SAFE- GUARD "SOLUTIONS" TO THE IAEA	6-4
7.0	THE FINANCING OF SAFEGUARDS	7-1
7.1	INTRODUCTION AND BACKGROUND	7-1
7.2	DISCUSSION	7-5
	7.2.1 Postulated U.S. Objectives	7-5
7.3	BRIEF REVIEW OF THE OPTIONS	7-14
7.4	COMPETITIVE DEMANDS FOR TECHNICAL ASSISTANCE	7-20

THE PROSPECTIVE DURABILITY OF THE IAEA  
SAFEGUARDS SYSTEM

1.0 INTRODUCTION

In this section of the report an effort is made to:

- o identify the major factors that will enhance the overall durability of the IAEA safeguards system or that may lead to its erosion.
- o address some of the worst case scenarios that could conceivably evolve in the IAEA and possibly compel the United States and other countries to explore or adopt alternate verification mechanisms for trying to detect, and thus deter, diversions of nuclear materials to proscribed or unknown uses;

The word "durability" as applied in this context means the continued willingness of the United States and most nations in the world to rely on the IAEA safeguards system as the key overt mechanism for helping to verify compliance with major international nonproliferation undertakings.

"Durability" in the first instance is largely an expression of political will on the part of the nations in the international community to accord importance to, and to rely on, the IAEA safeguards system as a central verification mechanism for non-proliferation purposes. It is a function of whether the major



nuclear supplier and consumer nations of the world continue to judge that they have more to gain by relying on (and supporting) the IAEA safeguards system than by turning to some alternate mechanism. Accordingly, it is related to the confidence that the nations of the world have in the ability of the IAEA system to remain a reasonably objective and credible verification mechanism. It also is a function of whether the countries participating in the IAEA system are prepared to give the safeguards system the requisite material, financial and political support that it requires to discharge effectively its responsibilities. Further, durability is a function of the underlying nature of the various treaties and bilateral agreements that explicitly accord safeguards responsibilities to the IAEA and whether, in the event of a failing in the IAEA system, any suitable and credible institutional alternatives to the IAEA system are available, or can be developed, and can receive the requisite political and financial support from the interested nations involved. There are three basic types of considerations that can affect the durability of the IAEA system:

- o factors related to the internal workings of the safeguards system;
- o factors that are external to the detailed operations of the IAEA itself but that nevertheless are relevant to the major role that the IAEA enjoys in the global non-proliferation regime; and
- o factors relevant to whether any alternatives to the IAEA system are practically available. (The IAEA system may be able to operate with poor or only moderate

AC4NC104

effectiveness for an extended period of time simply because no credible institutional alternatives may be available.)

Several other sections of this overall report bear directly on the question of internal technical and operational factors that may have an important effect on the durability of the IAEA safeguards system. This chapter of the report focuses primarily on those factors, largely of a policy or a political character, that could affect the longer-term viability of the IAEA safeguards system.

## 2.0 FACTORS FAVORING THE PRESERVATION OF THE IAEA SYSTEM

There are several factors strongly favoring continuing reliance by the United States and other nations on the safeguards system of the International Atomic Energy Agency. These include the following:

- o The safeguards system administered by the IAEA has become the central verification mechanism that is relied on by the great majority of governments throughout the world to help assure that nations conform to their non-proliferation obligations. This central role for the IAEA is enshrined in numerous international agreements, declarations of national policy, in national legislation within the United States and most importantly, in the Nuclear Non-Proliferation Treaty. While Euratom has its own important regional safeguards system, the IAEA is actively involved in applying safeguards within the European Community pursuant to a verification agreement with Euratom as called for by the NPT.
- o More specifically, the IAEA has the central verification responsibility under Article III of the NPT and if the Agency's safeguards system becomes seriously discredited or ceases to function in a credible manner, this could jeopardize the very viability of that Treaty. This serves as an important incentive for supporters of the NPT to try to keep the IAEA safeguards system working effectively.

- o Similarly, the London Supplier Guidelines as well as the terms of numerous international nuclear supply arrangements, call for the application of the IAEA safeguards system to nuclear materials and equipment transferred in international commerce. U.S. support of the IAEA safeguards system has always been strong and that commitment, (which long was a matter of U.S. policy) was made a matter of law in 1978 with passage of the U.S. Nuclear Non-Proliferation Act otherwise known as the "NNPA".
  
- o Pursuant to the NNPA (and in the absence of a Presidential waiver), no nuclear fuel or major reactor components can now be transferred from the United States to a non-nuclear weapon state unless all of the civil nuclear activities in that nation are subject to IAEA safeguards. While some other supplier states (such as France and the FRG) do not similarly insist on the application of such "full-scope" IAEA safeguards as a precondition to their nuclear exports, all of the major suppliers require IAEA safeguards to apply to nuclear fuels as well to defined items of nuclear equipment that they transfer to nonnuclear weapon states. Also, as we shall note below, more recently at the NPT Review Conference, U.S. efforts to induce other nations to endorse the goal of "fullscope" IAEA safeguards received a boost when a statement to this effect was included in the text of the Final Declaration which was agreed to by the Conference.
  
- o It also should be noted that while some bilateral co-operative agreements in the nuclear field, including most of those concluded by the United States, nominally

provide for the application of bilateral (U.S. administered) safeguards rights as a "fall-back" mechanism in the event the IAEA is unable to perform its safeguards task effectively, no such bilateral safeguards rights are currently being applied. Moreover, not all supplier nations have explicit rights in their agreements to apply bilateral safeguards themselves if IAEA safeguards fail for any reason. Accordingly, neither the international community nor the major nuclear suppliers now have in hand commonly agreed fall-back safeguards mechanism to apply, if the IAEA system can no longer be relied on either in a specific instance or in a range of circumstances.

- o All of the foregoing factors have lead many countries to believe that abandonment of the IAEA system, would be unthinkable and that the system simply must continue to work effectively. These factors also suggest, however, that the international nuclear community is in a highly vulnerable position if the IAEA system fails to work for any reason.
- o Within this context, IAEA safeguards have become not only an integral part of the global nonproliferation regime but also an essential basis for the conduct of most international nuclear commerce relating to the supply of nuclear fuels, equipment and components. Many believe that the global system of civil nuclear trade between nations would collapse if the IAEA system itself failed to operate in a satisfactory fashion and if no institutional alternatives were available.

- o It also should be recalled that there were a number of fundamental policy considerations that prompted nations to switch from bilateral safeguards several years ago to reliance on the IAEA system. In particular, it was judged that a multinational safeguards system (involving the participation of countries of different and sometimes contrary political persuasions) would offer more credible assurances of the absence of diversions to the world at large than a series of bilateral safeguards arrangements between closely allied "like-minded" nations. While bilateral safeguards might prove to be technically effective, they were susceptible to mistrust in cases where the two parties were so closely tied as to make collusion possible.

On the other hand, the involvement in the IAEA of some nations at odds with each other would help keep the safeguards system "honest" whereas one could not always assume this situation would pertain to controls administered on a bilateral basis. Accordingly, a number of years ago the United States suspended its practice of having U.S. inspectors apply the bilateral safeguards rights incorporated in U.S. agreements for cooperation in favor of having this safeguards function assumed by the IAEA. While some consumer nations initially had reservations about switching from U.S. bilateral controls to IAEA safeguards this has not proved to be a basis for serious concern in the ensuing years. On the contrary, as new suppliers of nuclear goods and sources have entered the field, consumers generally have expressed a clear preference for IAEA safeguards as well as a reluctance to

submit to a multiplicity of bilateral controls administered by different suppliers. (More broadly some consumer states also have argued that individual supplier state rights of consent over such transactions as the reprocessing of the fuels they supply should ultimately be phased out in favor of some generalized "multilateral" regime. For example, it has been suggested that if an International Plutonium Storage Regime for excess plutonium is ever established by the IAEA this should reduce the need to administer bilateral consent rights that now affect reprocessing or the use of plutonium.)

In light of the various factors which have been just presented it can be assumed that most supplier and consumer nations will move away from the current heavy reliance on the IAEA safeguards system only under the most acute and adverse circumstances when continued reliance on the IAEA system is no longer politically and technically credible either in a specific situation or as a general matter. Thus, at first blush, the IAEA safeguards system would appear to enjoy the prospects of considerable long-term "staying power."

In addition to the importance of the IAEA safeguards system to international nuclear commerce, it is also important to recognize that the IAEA performs a vital function for the international nuclear community as a central source of technical information and originator of universally applicable standards and guidelines to help protect health and safety. The importance accorded to this function of the IAEA by the international community also can be viewed as a significant factor mitigating in favor of preserving the IAEA, thereby enhancing the durability of the IAEA as an

AC4NC104

international institution. This particular point has recently been underscored by the tragic nuclear accident at Chernobyl in the USSR. Although this accident has no direct relationship to the nonproliferation regime or to IAEA safeguards per se, to the extent that the international community has turned to the IAEA both for information on and reaction to the accident, the international nuclear community has reaffirmed its reliance on the IAEA. Thus, this momentum in support of the health and safety functions of the IAEA as a result of the Chernobyl tragedy would appear to enhance the overall durability of the IAEA.



## 3.0 POTENTIAL CHALLENGES TO THE DURABILITY OF THE IAEA SYSTEM

Notwithstanding this heavy international investment in the IAEA system, there are a number of developments that, at least in theory, could seriously throw into question the system's credibility and ultimate "durability". These developments could range considerably in their severity and immediacy of effect. The following paragraphs are designed to illustrate some of the kinds of adverse occurrences that conceivably could occur that could serve to threaten the foundation of the system. While these examples are hypothetical in nature, they are designed to highlight some of the contingencies that the United States and other nations may have to take into account in developing their non-proliferation strategies. These potential adverse effects are listed under two major categories:

- Possible adverse developments largely associated with operations within the IAEA itself.
- Possible adverse developments largely outside of the IAEA's control and jurisdiction.

By "IAEA", within this context, we mean operations within the purview of the IAEA Secretariat, the Director General, the Board of Governors and the IAEA General Conference. It is recognized that these two categories overlap to some extent since adverse actions taken by IAEA member states within the IAEA can be reflective of member state actions and attitudes that are beyond the Agency's control.

It should be noted that when this study was first commissioned by ACDA there was a degree of pessimism in several quarters of the U.S. Government that the political situation in Vienna was

AC4NC104

eroding, that the United States might have to disassociate itself from the IAEA in protest of harsh treatment of Israel, and that we even might have to look for some institutional alternatives to the use of the IAEA safeguards system.

Accordingly, as painful as the prospect appeared to be it was decided that this particular study should consider not only some of the methods for countering these adverse political trends in the IAEA but also what institutional alternatives to the IAEA might be available, if the IAEA system ever "failed" for any reason.

As matters have actually progressed, in the intervening months, there has been a marked upsurge in optimism in Washington about the future prospects for the global nonproliferation regime - including the IAEA safeguards system. This has been due to the relatively successful outcome of both the recent 1985 NPT Review Conference as well as the September 1985 IAEA General Conference that was able to avoid a serious and potentially very damaging confrontation over Israel. In subsequent sections of this chapter we assess these developments, endeavor to place them in a longer term perspective and seek to identify developments that could have the effect of undermining the recent progress that has been achieved. Since our objective is to try to assess all major factors that could materially affect the long term durability of the IAEA safeguards system we necessarily look at some "worst case" scenarios, however far fetched some of these may appear to be at this juncture.

### 3.1 POSSIBLE ADVERSE DEVELOPMENTS THAT ARE LARGELY ASSOCIATED WITH THE INTERNAL OPERATIONS OF THE IAEA ITSELF

One can visualize a range of possible scenarios "internal" to the IAEA, that could serve to seriously threaten the viability of the safeguards system. Some of these possibilities are outlined in the following paragraphs.

#### 3.1.1 Slow Death And Deterioration In The System

As one possibility, the IAEA safeguards system could gradually die a "slow death" due to a variety of adverse circumstances. There could be a gradual but steady deterioration in the diligence, professionalism and technical effectiveness with which IAEA safeguards are performed as well as a growing depletion in the needed financial and human resources available to the IAEA safeguards staff. The deterioration in technical effectiveness could be attributable in part to a lack of aggressiveness by the IAEA Secretariat in implementing the rights the Agency legally enjoys under INFCIRC/153 or INFCIRC/66. This could be compounded by a strong reluctance by some member states to adequately comply with necessary IAEA safeguards requests.

Ultimately, under this "slow death" scenario, the degradation in the quality of IAEA performance might reach the point where there would be wide perceptions that the Agency's system had acquired a substantially reduced capability to detect diversions of nuclear materials.

This perceived erosion in the technical and administrative effectiveness of the system could be caused or accompanied by a

growing tendency of some IAEA member states to politicize matters in Vienna to the point where it might become extremely difficult to obtain the requisite support from the Board of Governors and the General Conference for budgets or program proposals designed to cover reasonable safeguards needs. In an extreme situation, divisive political factions might become so dominant in Vienna that it might no longer be feasible to perform an "objective" IAEA safeguards operation at some safeguarded facilities in highly controversial states that have hostile relations with many other nations. This could apply, for example, to South Africa (in the case of the Koeberg and SAFARI reactors) or to Israel in the case of the IAEA safeguarded Nahel Soreq reactor. On the resource side, the funds budgeted for safeguards purposes might be insufficient to cover minimum needs either due to IAEA member state antagonism to the safeguards system, a preference and ability by the lesser developed member states to divert scarce resources to IAEA programs having a technical assistance character or by austerity moves to reduce the IAEA's budget that might be pursued by various national treasuries.

In the past some U.S. observers of the IAEA system have felt that unless corrective measures are devised it only will be a matter of time until (a) the developing countries, (or so-called "Group of 77") will "take over" the Agency and shift the priorities and resources away from safeguards to technical assistance, (b) the situation in Vienna will become more confrontational politically because of an increased use in that forum of "bloc" voting techniques, (c) it will be impossible to ward off demands that an increasing share of the Agency's resources should go to programs that are "more relevant" than safeguards to the interests of the LDC's.

AC4NC104

People sharing this anxiety have felt that, most likely, the next IAEA Director General (DG) to follow Mr. Blix will have to come from a nation in the developing world, since the LDC's have never held the DG position. There has been a fear that such an individual might tend to favor "LDC" interests which have been somewhat cool to safeguards, prone to favor technical assistance and prone to bring divisive UN type political tactics into IAEA operations. However, others have felt that there have been clear encouraging signs at both the recent NPT Review Conference and the 1985 IAEA General Conference that a growing number of developing countries have come to appreciate that they have an important security stake in the success of the NPT and in the preservation of the IAEA safeguards system even though they themselves may have little current interest in nuclear power. Also, it probably is erroneous to characterize the developing countries as the strongest opponents of IAEA safeguards since some of the greatest difficulties for the IAEA Secretariat have been caused by some more advanced IAEA member states.

As still another characteristic or variant of a "slow death" scenario, the morale in the IAEA inspectorate could erode to a relatively low point thereby threatening the fundamental effectiveness and efficiency of the safeguards process itself. This deterioration could be a function of poor IAEA management, the absence of adequate incentives and rewards to recognize outstanding safeguards personnel, limited prospects for advancement, adverse working conditions for inspectors in the field, or the failure of top management to support the safeguards staff in a serious dispute with a recalcitrant member state. As an associated development, there also could be a recurrence in the public media of highly critical comments of the IAEA

AC4NC104

safeguards system by disenchanted existing or former IAEA inspectors. It will be recalled that this actually occurred in a very troubling form within the United States when a former member of the IAEA safeguards staff publicly attacked the effectiveness of the IAEA system in the specific context of the Israeli air strike against the Iraqi Osirak research reactor.

There also has been a tendency by some critics to cite these concerns in contending that the IAEA is unable to apply effective safeguards to activities involving reprocessing or the use or handling of plutonium fuels. Therefore, while the morale in the IAEA safeguards staff evidently has improved in recent years, the potential threats to the "durability" of the system associated with unrest in the Secretariat cannot be discounted as purely academic in nature. Some inspectors still have to put up with arduous working conditions that can be compounded by frequent travel, long separations from family, or limited cooperation from the member states being inspected. Several of the individuals on the safeguards staff believe that they have little hope of advancement within the Secretariat or that their efforts and contributions to the IAEA are not likely to be given sufficient recognition by their national governments or their employers back home when their Vienna assignments are completed. Accordingly, unless corrective measures are taken to improve these perceptions they could serve to undermine the credibility and "durability" of the basic safeguards system. (Elsewhere in this report we recommend some modest, but potentially useful changes in personnel practices that could help ease concerns in this area).

3.1.2 Failure To Keep Pace With The Workload

As another hypothetical scenario, and (largely due to a significant and unplanned increase in its workload), the IAEA Secretariat could find itself unable, both technically and administratively, to keep pace with some important activities subject to IAEA controls. Such pressures could increase, for example, if there is a significant expansion (following the recent example of EDF in France) in the quantity of separated plutonium that is fabricated and transported under safeguards for use in experiments on recycling plutonium in thermal light water reactors. To date, the experimental programs devoted to plutonium recycle operations have been relatively modest in size and it seems unlikely that the IAEA will be confronted with a massive increase in the size of such programs on short notice and without advance planning. Nevertheless, some observers believe that the pressures on the IAEA safeguards program due to enhanced plutonium use will substantially grow as inventories of separated plutonium build up in Western Europe and Japan as the consequence of already firmly planned reprocessing activities.

More specifically, the breeder programs in these countries are slowing down and could not be expected to absorb, in any case, the sizeable inventories of separated plutonium that will be produced. The storage costs for separated plutonium are sizeable and there also is an incentive to use stored plutonium before an increase in the americium content requires that it be subject to further clean-up. Accordingly, some observers believe that the pressures to use plutonium fuels in thermal reactors may increase even though the building of new reprocessing capacity may otherwise be an uneconomic and dubious proposition at this time. To the extent this increased usage adds significantly to

plutonium flows and inventories in different locations around the world the burdens on the IAEA inspectorate will grow and some observers have fears this could start to overload the IAEA safeguards system and impair its credibility.

3.1.3 The Disaffection Of One Or More Significant Political Groups Or Factions Within The IAEA

Under this hypothetical scenario, the IAEA safeguards system would lose ground due to the disaffection from the safeguards program of a significant fraction or component of the Agency membership. There have been two serious grounds for concern in this regard in the past and these tendencies will require careful monitoring in the future. One relates to the possible disaffection from safeguards of the developing countries in general, and the second relates to tensions between NPT and non-NPT parties in Vienna.

First, there has been almost a chronic tension in Vienna between some of the more industrialized supplier states who have tended to be the strongest proponents of the safeguards program and several developing countries who typically have expressed greater interest in those IAEA programs that have a technical assistance or training characteristic. In the past, several of these developing countries have asserted that the IAEA safeguards program has been absorbing an ever increasing share of the Agency's resources whereas insufficient funds (or for that matter insufficient attention) have been allocated to those programs, like technical assistance, that are nominally more closely related to the national needs of LDCs. The developing countries also have argued that they should not be compelled to contribute



increasing funds to the safeguards program when the demands for these resources have generally been driven by the more industrialized IAEA member states who are the ones having the facilities that call for the application of controls.

Due to considerations of this nature (and without commenting on the merits of these assertions, which are arguable) a special formula for financing safeguards was adopted a number of years ago that places a ceiling or cap on the assessed contributions that the poorer nations in the IAEA will have to make to the safeguards program. Also, efforts have been made through the years to both increase the level and provide a more stable base for financing the IAEA technical assistance budget which is financed on a voluntary basis. This has been achieved by preparing and regularly up-dating "indicative planning figures" three years in advance of a budget year that are designed to represent reasonably firm forecasts of the budgetary levels that the members are prepared to accept and finance through the IAEA voluntary fund.

Some observers believe that the tensions between the industrialized and the developing nations related to the competition between safeguards and technical assistance has eased in recent years because of these efforts. Also, the observation has been made to IEAL that one of the reasons the recent NPT Review Conference was so successful was due to the fact that many of the developing countries have come to accept the proposition that support of the NPT as well as the IAEA safeguards program is in their national security interest even though they may have little current need for nuclear power.

On the other hand, some observers believe that the situation in Vienna is not a stable one in this general area of allocating resources and that future tensions will arise as the budgetary requirements of the safeguards program continue to arise. More basically, some individuals who are actively involved in IAEA matters believe that in recent years the United States has adopted too narrow a view of where its priorities lie in the IAEA program, that the United States has tended to project an image in Vienna to the effect that basically Washington is interested only in the safeguards program and that this attitude has been genuinely resented by the developing countries and IAEA technical personnel who also have other interests as well. People sharing this concern believe that this approach by a leading IAEA nuclear country like the United States is likely to be very counter-productive in the long term since it might contribute to a disaffection of several developing countries from the IAEA and its programs - including policy support of the objectives of IAEA safeguards. In a later section of this report dealing with financial issues, we review the merits of these observations with the view of trying to ascertain whether any new U.S. approaches to financing safeguards or technical assistance may be in order. At this point, however, we should hasten to add that some people do not agree with this criticism of the United States. They make the point that if the United States had such an image it has shed it in recent years through steady support of non-safeguards as well as safeguards activities in the IAEA.

The second major type of "disaffection" that could occur within the IAEA towards safeguards would be one attributable to tensions that exist between IAEA member states that are parties to the NPT and those that are not. As one might expect, nations like India,

Argentina, Brazil and Pakistan have tended to be quick to argue that no favoritism should be shown to NPT parties within the programs and activities of the IAEA. They also have tended to favor approaches that would give the IAEA Secretariat and Board, less rather than more, power and independence in the safeguards and related nonproliferation areas. This has been evidenced in the minimalistic approach that Argentina and India have taken towards the powers the IAEA should be accorded under any postulated International Plutonium Storage Regime (IPS).

With these factors in mind, the "nonproliferation" movement in general, and the IAEA safeguards system in particular, could lose some ground if the behavior of the non-NPT parties in the Agency ever became more radical or alienated from the attitudes of the wider number of IAEA member states who are NPT parties. Moreover, one could not tolerate a situation in which some of the non-parties to the NPT, by their intransigence on specific safeguards issues, would be allowed to eviscerate the IAEA safeguards system. So far this issue has been kept under reasonable control and it must be stressed that the IAEA is extremely important in that it is the only regular meeting ground concerned with nonproliferation issues that exists between the NPT and non-NPT parties. By keeping the non-NPT parties actively involved in IAEA matters one has the opportunity to influence and moderate their behavior on nonproliferation issues and to try to identify constructive areas of mutual agreement. We have our doubts, however (due to the approach taken by some of the non-parties to the NPT), whether the current atmosphere in Vienna would permit the IAEA membership to assign a substantial new role in the nonproliferation area to the Agency.

#### 3.1.4 Rapid Political Crisis - Including A U.S. Walkout

As still another theoretical adverse scenario, there could be a political and potentially rapid crisis over the issue of the status of Israel in the IAEA - possibly leading to a second U.S. withdrawal from participation in the IAEA. Punitive and possibly biased actions (including exclusion from the IAEA membership) could be taken by a future IAEA General Conference against the Israel. In the event the General Conference took a manifest unfair punitive action against Israel, the United States presumably would again withdraw from active participation in the Agency, and it might significantly freeze or reduce its financial contributions to that body. Under this postulated sequence of events the Agency's safeguards system could remain reasonably effective from a technical perspective for most types of activities. However, there could be a serious erosion of the principle of "universality" of national participation in the IAEA. This principal of "universality" also would be broken if South Africa were ever permanently excluded from IAEA membership. However, if this occurred, we have our doubts as to whether the United States would walk out of the IAEA as it did for Israel.

#### 3.1.5 Refusal By Some States To Participate Further In The System

As a derivative or variant of the scenario just described, and although the possibility may be very far fetched the atmosphere in the IAEA towards South Africa and Israel could become so hostile as to induce one or both of these states to refuse to allow IAEA inspectors into their countries to inspect safeguarded facilities. This would raise the question of what kind of

alternate safeguards arrangements, if any, should be proposed to cover the Israeli and South African reactors now subject to IAEA controls (the Nahel Soreq reactor in Israel and the Safari and Koeberg reactors in South Africa).

The possible implications of either of the adverse developments just described (a U.S. "walkout" from the IAEA, or a withdrawal of Israeli or South African facilities from IAEA safeguards) will be discussed in this chapter.

As already noted, when this study was first conceived there were serious concerns within the U.S. Government, including ACDA, that developments that would exclude Israel and South Africa from participation in the IAEA might well occur at the IAEA General Conference which was held September 1985. There were fears that Mr. Blix might not be successful in his then current efforts to work out arrangements between Israel and its detractors at the IAEA General Conference. Under the terms of the accommodation that Blix was seeking, Israel would provide Blix with written assurances that it was not Israel's policy to attack nuclear facilities devoted to the peaceful uses of atomic energy. In return, the General Conference would remove from its agenda the item that has appeared on the Conference agenda for the past several years that would call for actions that would deprive Israel of its full entitlements associated with IAEA membership. As a related matter there were some concerns that South Africa would be excluded from IAEA membership.

As matters actually developed and as they will be described in greater detail later in this section, neither of these fears materialized and through a complex series of events Iraq was unsuccessful in its efforts to have sanctions imposed against

Israel at the September 1985 General Conference. Also, South Africa was not excluded from IAEA membership. Nevertheless, one can not wholly discount the fact that at some future date there may be a resurgence of efforts to exclude one or both of these nations from the privileges of IAEA membership and with the turmoil now going on in South Africa it would appear that this could be a possibility. Also, while it was feasible to prevent adverse actions against Israel at the 1985 General Conference, Iraq was subsequently able to induce the UN General Assembly to pass an anti-Israeli resolution that calls upon the IAEA to take further steps to help assure that Israel does not again attack a peaceful nuclear facility. While this resolution has no binding effect on the Vienna agency it could well be employed by Iraq and others to try to reopen the debate on the Israeli issue at the next (1986) IAEA General Conference.

3.1.6 There Could Be An Apparent Serious Diversion Of  
Safeguarded Materials

While the exclusion of either Israel or South Africa from the IAEA could undermine the concept that IAEA safeguards should be universally applied to non-nuclear weapon states neither action would, in and of itself, throw into serious question the technical efficacy of the IAEA safeguards system. However, other developments could occur that would serve to challenge the very fundamental basis for confidence in the system's effectiveness. For example, there could be a serious and largely unambiguous diversion of materials subject to IAEA safeguards without IAEA detection and under conditions suggesting that the IAEA was not performing its safeguards job in a competent manner. Alternatively, there could be a diversion performed with such

skill that most people would have to agree that even the most diligent application of IAEA safeguards could not have detected the activity. In either case, the credibility of the IAEA system would be seriously impaired especially if the action involved was directly related to the manufacture and testing of a nuclear device by an errant state. If such developments ever occurred serious questions and challenges could be raised in several governmental bodies, including the U.S. Congress, as to whether the IAEA can be relied on as a key verification mechanism, whether some alternate mechanisms should be adopted or whether there should be a significant overall curtailment in international nuclear commerce.

3.1.6 Failure By The IAEA Governing Organizations And Member States To Respond Decisively To A Provocation

Under still another adverse scenario the IAEA safeguards system could function reasonably well at the "technical" level but founder badly at the political level. For example, the durability of the system could be threatened if the IAEA Board of Governors, (and/or the interested member states) failed to act or to censure a grievous breach of an IAEA safeguards agreement by a state even if there was an unambiguous serious violation or act of non-compliance. This is not an entirely unrealistic prospect when one considers the different political factions that are on the Board and the growing tendency that some states have evidenced to bring confrontational "bloc" type politics into IAEA operations. For example, in the event the Director General brought a serious question about a possible violation before the Board of Governors, some members of the Board, (who might be politically allied with the member state creating the problem) could seek to obstruct a Board action aimed at applying censure or sanctions to the offending state. The kinds of adverse Board

actions that might be frustrated could include a Board request that the state involved comply with its safeguards obligations, or failing that, a Board conclusion that a serious breach of an agreement had occurred, a Board condemnation of the Act, or the triggering by the Board of the reporting and related sanctions provisions called for by Article XII of the IAEA Statute.)\* The risk that such a scenario might occur could increase if the developing nations, succeed over a period of time in their efforts to expand the membership in the IAEA Board of Governors and if this made it more difficult to reach a consensus in the Board on such an issue. On the other hand, (and as has been suggested by Mr. David Fischer in his recent book on IAEA Safeguards)\*\* a statement issued by the Director General alone

---

\* Footnote: Article XII of the IAEA Statute includes the following paragraph:

"C. The staff of inspectors shall also have the responsibility of obtaining and verifying the accounting referred to in sub-paragraph A-6 of this article and of determining whether there is compliance with the undertaking referred to in sub-paragraph F-4 of article XI, with the measures referred to in sub-paragraph A-2 of this article, and with all other conditions of the project prescribed in the agreement between the Agency and the State or States concerned. The inspectors shall report any non-compliance to the Director General who shall thereupon transmit the report to the Board of Governors. The Board shall call upon the recipient State or States to remedy forthwith any non-compliance which it finds to have occurred. The Board shall report the non-compliance to all members and to the Security Council and the General Assembly of the United Nations. In the event of failure of the recipient State or States to take fully corrective action within a reasonable time, the Board may take one or both of the following measures: direct curtailment or suspension of assistance being provided by the Agency or by a member, and call for the return of materials and equipment made available to the recipient member or group of members. The Agency may also, in accordance with Article XIX, suspend any noncomplying member from the exercise of the privileges and rights of membership."

\*\* Safeguarding The Atom - A Critical Appraisal; David Fischer and Paul Szaz; Edited by Jozef Goldblat



AC4NC104

outlining a serious safeguards problem might have sufficient weight in and of itself, even in the absence of a Board action, to help correct a situation if it leads to the application outside of the IAEA of sufficient pressure on the state that is creating the difficulty.

Also, there is some reason to believe that several members of the Board of Governors are likely to be supportive of the Secretariat and will rise above political factionalism when an important issue relating to compliance with a safeguards agreement needs to be cleared up. For example, as Fischer notes, most members of the Board of Governors (including those from developing countries) were supportive of the Director General a few years ago when he advised the Board that the Secretariat would be unable to certify that no diversion had occurred at the Pakistani KANUPP reactor unless Pakistan would agree to an upgrade of the IAEA surveillance measures at the reactor. In that instance, while there were some apologists for Pakistan on the Board, the concern of most members to preserve the integrity of the safeguards system seemed to take precedence over political factionalism and voting block loyalties. Nevertheless, some interested students of the IAEA continue to have doubts as to whether the IAEA Board of Governors necessarily can be relied on to condemn an adverse act and possibly call for the application of sanctions in the event that the Director General judges that a major violation of a safeguards agreement has occurred. To the extent such fears ever prove well founded in practice the credibility of the IAEA as an important nonproliferation mechanism obviously will be impaired, but not necessarily destroyed or seriously discredited.

### 3.2 FACTORS AFFECTING "DURABILITY" THAT ARE LARGELY EXTRINSIC TO THE IAEA SAFEGUARDS SYSTEM ITSELF OR THAT ARE OUTSIDE OF THE IAEA'S CONTROL

The foregoing section listed some potential adverse effects relating to the durability of the IAEA system that might largely be attributable to the internal workings of the IAEA itself, it being recognized that many of these activities, in turn, reflect, the attitudes and policies of the member states. In this section we list some potentially adverse developments which would be largely outside of the IAEA's authority, influence or control.

#### 3.2.1 Collapse of the NPT

There could be a serious setback in the status of the IAEA safeguards system if the NPT is not extended beyond its current term in 1995 or if several key nonnuclear weapon states withdraw from the Treaty around or prior to that date (due, for example, to concerns they might have that Article VI of the Treaty is not being adhered to.)

On the other hand, one could argue that if the NPT itself becomes diminished in importance this may make it even more important to try to rely on the IAEA safeguards system as the primary vehicle to achieve nonproliferation objectives. It would still be feasible, for example, for non-nuclear weapon states to submit voluntarily to full-scope IAEA safeguards even if the NPT ceased to exist. Nevertheless, an abrogation by some states of their NPT obligations, or worse still, a failure to extend the Treaty, would be a particularly severe blow to the goal of nonproliferation as well as the continued ability of

nations to cooperate with each other in civil nuclear commerce. While one might view such threats to the NPT as highly remote, they serve to underscore the fact that the strength of the IAEA system only is as good as the political will of the participating countries including the support given to the underlying treaties or agreements that employ the IAEA system for verification purposes. This is not to say, however, that IAEA safeguards must conform to the "least common denominator" among the member states, or that individual states, having once agreed to a series of IAEA safeguards measures can unilaterally violate them with impunity.

### 3.2.2 Military Attack Against An IAEA Safeguarded Facility

The Israeli strike against Iraq serves as another example of the kind of event (largely outside the IAEA's control) that could seriously erode U.S. domestic, as well as foreign, confidence in the relevance and efficacy of IAEA safeguards. While another attack of this kind would appear highly unlikely in light of the backlash against the Osirak strike and the formal written assurances that Israel recently provided to the IAEA Director General, one cannot exclude the possibility that Israel or some other vulnerable state might again take a military action against a purported foreign civil nuclear facility if it judged that such a facility was really being built for hostile military purposes. From an IAEA standpoint the most damaging thing that could occur would be to have such a military strike take place against an IAEA safeguarded facility under circumstances suggested that the IAEA was not performing its responsibilities effectively or had not uncovered some seriously incriminating information at the

target facility. However, even if the facility were not under safeguards, another military attack could lead to generalized questioning of the efficacy of the entire global "nonproliferation" regime - including of the real relevance and value of safeguards.

3.2.3 As A Function Of A Domestic U.S. Policy Shift The IAEA Could Be Judged By A Future U.S. Administration As Inherently Unable to Effectively Safeguard Some Kinds of Important Technical Operations

Under this scenario, due to a future change in U.S. Administrations the U.S. could revert to the strongly anti-reprocessing and anti-plutonium attitudes that distinguished United States policy in the late 1970's. The IAEA would be judged by the U.S. as unable to perform adequate safeguards in certain "sensitive" bulk-handling facilities (such as reprocessing plants) that handle weapons usable materials. Some U.S. critics of plutonium use already argue that the IAEA is inherently incapable of safeguarding such activities even in cooperative nations like Japan. While this is not the policy of the current Administration and certainly not the policy of other industrialized nations, under a future U.S. Administration, the United States conceivably could adopt an even harder anti-plutonium line than in the 1970's. In such an event, the U.S. Executive Branch might seek to encourage an international ban or a phaseout of reprocessing and most plutonium use, and U.S. officials might take the position that it is inherently infeasible for the IAEA to perform a technically credible job in applying safeguards to such activities. While several IAEA member states probably would take strong exception to such a U.S. stance, public and legislative confidence in the IAEA system, at least in the United States could be seriously eroded in the process.

This hypothetical scenario tends to underscore the considerable effect that the behavior of one leading IAEA member state, like the United States can have on the stability, acceptance and "durability" of the IAEA safeguards system. There are other less dramatic scenarios that serve to illustrate the same point. A reduction of U.S. financial or "in kind" contributions to the IAEA for whatever reason (but especially following a postulated U.S. "walk-out" over an Israeli issue) could, in itself, seriously erode the "durability" of the IAEA system. The acuteness of the blow would depend on the severity and immediacy of the reduction in the U.S. financial contributions. The point here is a crucial one -- namely that the efficacy of the IAEA system is directly and closely linked to the tangible political, financial and material support it receives from the major member states.

#### 3.2.4 Other Adverse Effects

There are still other scenarios that could serve to undermine confidence in the value of the IAEA safeguards even if they involve matters outside of the IAEA's responsibility or control. For example, while the IAEA has prepared suggested guidelines in the area of physical security, the basic responsibility for physically protecting nuclear materials and facilities rests with national governments. Nevertheless, if a terrorist group were successful in seizing some weapons usable materials or in doing some serious and environmentally harmful damage to a nuclear facility, concerns could arise about the general adequacy of the "nonproliferation regime". Even though IAEA safeguards were in

AC4NC104

no way at fault, such an event could serve to undermine confidence in the relevance or "value" of the IAEA safeguards system by underscoring the fact that, stripped to its essentials, that system is incapable of preventing a forcible seizure of nuclear materials by a dissident group. These examples thus serve to illustrate still another point --namely that the "durability" of the IAEA safeguards system not only will be heavily dependent on the political support that the IAEA system itself enjoys from its member states but also that it may be influenced by the effectiveness of other nonproliferation and related protective measures that fall outside of the IAEA's direct activities or responsibilities.

Finally, some might argue that if an additional state joins the nuclear weapons club this also would serve to undermine the IAEA safeguards system. This is because it would underscore not only that safeguards cannot prevent proliferation but that some nations are not prepared to forego nuclear weapons and rely on the IAEA to help protect their vital interests. On the other hand, the entrance of another state to the "nuclear club" could trigger a broad international rededication to the objective of nonproliferation, including support of the IAEA safeguards system. Also, if a nation undertakes a separate dedicated weapons development program completely divorced from IAEA safeguards, this admittedly would be a reversal for nonproliferation but hardly an indictment of either the efficiency or of the continued importance of IAEA controls.

#### 4.0 THE CONSEQUENCES OF SOME REGRESSIVE DEVELOPMENTS

##### 4.1 INTRODUCTION

In reviewing the foregoing scenarios it is somewhat difficult to forecast which one, if any, is more likely to occur or in what sequence any such adverse developments might take place. Hopefully and most likely none of these developments will materialize, in fact.

As we have noted, when this study was first commissioned some of the major anxieties that were on the minds of the nonproliferation community included the following:

- ° In the near term, since the outcome of the Israeli issue in the IAEA was still unknown it was feared that the United States might again have to walk out of the IAEA if the General Conference of September 1985 took any action calling for IAEA sanctions against Israel that would, for example, deprive it of the ability to attend IAEA meetings, receive technical assistance, etc. etc.
- ° Beyond this, and for the longer term, there were fears that some disturbing trends in Vienna might serve to

make the IAEA as confrontational and political as the United Nations and that this process would ultimately destroy the Agency's technical credibility in the safeguards area. This prompted ACDA to request inter alia, an evaluation of the feasibility of employing institutional alternative to the IAEA safeguards system if the IAEA system failed in a major way for any reason.

#### 4.2 SUCCESSES ACHIEVED AT THE 1985 NPT REVIEW CONFERENCE AND 1985 IAEA GENERAL CONFERENCE

As the situation has actually evolved since this study was first initiated, both the recent NPT Review Conference and the 1985 IAEA General Conference produced some highly encouraging results. These included some positive developments in both Conferences that are directly relevant to the future prospects and support the IAEA safeguards system is likely to receive from the international community.

This raises the broader question as to whether things have improved so significantly in recent months as to give one a greater feeling of confidence about the continued viability of IAEA safeguards system for the future, or whether there are still some grounds for concern, whether some of the same issues that arose in the past could conceivably reoccur, and whether there may still be challenges to the durability of the IAEA safeguards system that have to be factored in, and potentially countered, in the evolution of future U.S. nonproliferation strategy.

While it is not feasible to answer this question in any definitive manner, in the following paragraphs we attempt to summarize



not only some of the recent positive developments but also to identify some of the nearer-term challenges to the durability of the IAEA system that may still have to be confronted.

#### 4.2.1 The Third NPT Review Conference

The Third Review Conference of the Parties to the Non-Proliferation Treaty, which was held in Geneva from August 27 to September 21, 1985, and attended by 86 states parties to that Treaty, was considerably more positive and constructive than many had predicted. Prior to the Conference, there were fears that the United States and the USSR would be strongly attached for not having made greater progress in reducing their nuclear arsenals as anticipated by Article VI of the Treaty. Also, since the prior Review Conference in 1980 had failed to agree on any final declaration, there were doubts as to whether the 1985 Conference would do much better.

More fundamentally, there were anxieties as to whether any parties to the Treaty would start to disassociate themselves from its provisions either because of the issue of Article VI or because of concerns that the principles set forth in Article IV of the Treaty (relating to cooperation in civil nuclear field) had been violated by the adoption by some countries -- most notably the United States -- of highly restrictive nuclear export legislation. There were fears that, as had been the situation in 1980, the 1985 Review Conference might be dominated by a sentiment that the non-nuclear weapon states party to the Treaty had been somewhat betrayed by the more advanced nations (and notably the nuclear powers) who had not fulfilled their share of the "basic bargain" that was reflected in the Treaty. As matters evolved, however, and following careful groundwork by the U.S.

delegation, a substantial Final Declaration was adopted by the Conference that was highly supportive of the Treaty, of the International Atomic Energy Agency, and of the IAEA safeguards system.

While the Final Declaration of the Review Conference gave substantial emphasis to the need for further progress toward nuclear disarmament in general and a comprehensive test ban treaty in particular and included some discussion of security assurances to non-nuclear-weapon states parties to the Treaty the provisions most directly relevant to supporting the IAEA and its safeguards system are highlighted below.

(a) After citing the value of international safeguards to regional and international security, and noting the dangers posed by unsafeguarded nuclear facilities, the Declaration urges "all states in their international nuclear cooperation and in their nuclear export policies and, specifically, as a necessary basis for the transfer of relevant nuclear supplies to non-nuclear-weapon states, to take effective steps towards achieving" safe-guards on all the peaceful nuclear activities (both current and future) of such recipient states. (para. 4). It notes that IAEA safeguards have not hampered the economic, scientific or technological development of the parties to the Treaty or international cooperation in peaceful nuclear activities, and urges that this situation be maintained (para. 9).

(b) The Declaration welcomes the voluntary offers of the U.S., the UK, and the USSR and France to accept the IAEA safeguards on some of their peaceful nuclear facilities, and urges the People's Republic of China to do likewise. (The week after the Declaration was adopted, the Chinese announced an offer to do so.) It recommends further evaluation of the economic and practical possibilities of extending safeguards to additional civil facilities in nuclear weapon states as and when IAEA resources permit, and consideration of the separation of civil and military facilities in such states. It also notes the value of commitments by nuclear weapon states that nuclear supplies provided to them for peaceful

purposes be safeguarded against use for any military purpose (paras. 5 and 6).

(c) It commends the IAEA on its implementation of safeguards and urges it to continue to ensure the maximum technical and cost effectiveness and efficiency of its operations, while maintaining consistency with the economic and safe conduct of nuclear activities. It notes with satisfaction improvements in IAEA safeguards, citing the recent conclusion of a project to design a safeguards regime for centrifuge enrichment plants, but emphasizes the importance of further improvements, for which it makes some recommendations. These include recommendations that the IAEA Director General intensify his efforts to bring NPT safeguards agreements still outstanding into effect and that all states party to the NPT try to make the Treaty universal.

(d) It expresses the belief that further improvement of the lists of materials and equipment which call for the application of IAEA safeguards (the so-called "Zangger trigger list") should take account of advances in technology (para. 13).

(e) It recommends that the IAEA establish an internationally agreed effective system of international plutonium storage, (p. 5, para. 14) and commends the merits of international fuel cycle facilities, including multinational participation. While acknowledging that these are primarily a national responsibility, it sees advantages in international cooperation concerning spent fuel storage and nuclear waste storage (para. 19 and para. 9).

(f) It welcomes the significant contributions made by parties to the Treaty in facilitating safeguards and in supporting research, development and other supports for them, and urges that this be continued. It underlines the need for continued political, technical, and financial support to the IAEA (para. 15, 20 and 21).

(g) It calls upon all states to take IAEA safeguards requirements fully into account while planning, designing and constructing or modifying nuclear fuel cycle facilities (para. 16), and

(h) It calls on parties to assist the IAEA in applying its safeguards through the efficient operation of state

systems of accounting for and control of nuclear materials and compliance with all notification requirements, and to avoid abuse of the right to disapprove the designation of IAEA inspectors (paras. 17-18).

It is interesting to note that while the Conference urged the IAEA to continue to undertake measures to improve the effectiveness and efficiency of its safeguards operation (through such measures as the implementation of new instrumentation, further development of methods for evaluating effectiveness, more efficient uses of available resources) it also stressed the importance of adhering to the uniform and non-discriminatory implementation of safeguards. This bears emphasis since it would appear to rule out the utilization of overtly discriminatory practices by the IAEA in deciding how intensive a safeguards operation it should conduct in a given country. Political grounds for affecting differentiations would be ruled out and nations with high reliability would be treated as rigorously as those whose sincerity may be open to some question. Admittedly, from a formal perspective a finding of this kind by the NPT Review Conference has no binding effect on the IAEA itself. This formulation also would not rule out distinctions being drawn in the IAEA between the ways non-parties to the NPT are treated from a safeguards standpoint as contrasted to parties. However, this section of the Declaration is indicative of the sensitivity that some NPT parties have about being treated no less beneficially, from a safeguards standpoint, than other NPT parties. It also suggests the point that there are likely to be several limitations as to how far the IAEA Secretariat may be able to go in drawing explicit distinctions in its safeguards treatment of countries based on such factors as their cooperativeness with the IAEA safeguards staff or the credibility and apparent sincerity of their nonproliferation undertakings. (Expressed in other terms,

if distinctions are to be drawn in the safeguards treatment between NPT parties they may have to be rationalized on some technical operational grounds rather than on the basis of any explicit political criteria.)

After expressing concern about the 1981 Israeli attack on a safeguarded research reactor in Iraq, the Declaration recognizes that an armed attack on a safeguarded nuclear facility, or threat of attack, would create a situation in which the Security Council would have to act immediately in accordance with the provisions of the UN Charter. In addition, it:

- . emphasizes the responsibilities of the United States, the United Kingdom, and the USSR in their capacity as permanent members of the Security Council, to endeavor to give full consideration to all appropriate measures to be taken to deal with the situation, including measures under Chapter VII of the UN Charter;
- . encourages parties to be ready to provide immediate peaceful assistance in accordance with international law to any party to the NPT, if it so requests, whose safeguarded nuclear facilities have been subject to an armed attack, and to abide by Security Council decisions with respect to the attacking state;
- . urges cooperation in the Committee on Disarmament on the negotiation of measures to make such attack illegal (paras. 10-13).

Further, the Declaration expresses deep concern about the national nuclear programs of some non-parties to the NPT that may lead them to obtain a nuclear weapon capability, and states that any further detonation of a nuclear explosive device by any such state would constitute a most serious breach of the nonproliferation objective. It notes particular concerns about South African and Israel and cites calls on all states for the total and complete prohibition of the transfer of all nuclear facilities,

resources or devices to South Africa and Israel and to stop all exploitation of Namibian uranium, natural or enriched, until the attainment of Namibian independence (paras. 4, 5, 14, and 20). The Declaration also calls for the convening of another NPT Review Conference in 1990.

#### 4.3 CONCLUSIONS AND MEANING OF THE REVIEW CONFERENCE

There appears to be little question that the mood of the recent Conference, both in its support of the NPT in general, as well as the IAEA more particularly, was substantially more positive than that which prevailed at the Second Review Conference which was held in 1980. Several factors probably contributed to this result and they were both tactical and substantive. Tactically, the United States devoted many more months on this occasion to cultivating ahead of time, broad positive attitudes at the Conference and this clearly paid off. Also, the United States made it clear that it could live without a final document of any kind if no consensus was evident. This probably served to enhance the U.S. leverage since the United States avoided the syndrome of trying to placate some intransigent states in order to produce a final document. The atmosphere also probably was improved over the climate that existed in 1980 since in 1980 several foreign countries, notably those in Western Europe as well as Japan, were still smarting with resentment over the provisions of the U.S. Nuclear Non-Proliferation Act of 1978 as well as the anti-reprocessing and plutonium use policies of the Carter Administration.

The most encouraging thing, however, that appears to have evolved over the last five years is that there appears to be a greater recognition by a greater number of NPT parties that the NPT

basically is of value to their own security interests since these interests are unlikely to be served by a greater global spread of nuclear weapons.

It is far too early to tell whether this improved atmosphere will carry over into the next Review Conference in 1990 -- which will be affected by intervening events -- or what will be needed to ensure the extension of the NPT beyond 1995. While one can take some heart from the positive note on which the NPT Review Conference concluded, there is no assurance that this relatively positive tone will be maintained.

#### 4.4 IAEA GENERAL CONFERENCE - SEPTEMBER, 1985

The annual General Conference of the member states of the International Atomic Energy Agency, held in Vienna, Austria, September 23-27, 1985 was relatively harmonious and constructive and this too bodes well for the future. The major issues, all of which were successfully dealt with, are discussed below.

Israel. As has been noted, one of the most serious political issues that faced the IAEA since the 1981 Israeli attack on Iraq's safeguarded research reactor was the threat by several IAEA member states to deprive Israel of certain of its rights of membership in that Agency and the related threat that the United States would walk out of the IAEA once again if this should

occur. In response to the refusal of the 1982 General Conference to accept the credentials of the Israeli delegation, the United States not only walked out of the Conference but also suspended its participation in the Agency for several months. There followed a number of strong indications from elements in the Congress that they would insist on curtailing U.S. participation in the IAEA if Israel were ever again deprived of its full rights of membership.

The Israelis subsequently circulated a slightly ambiguous letter describing their policy against attacks on peaceful nuclear facilities, which was soon compromised by some unhelpful statements by individual Israeli officials. Within this context, crises of the type experienced in 1982 were only narrowly averted at the 1983 and 1984 General Conferences. The 1984 Conference adopted a resolution demanding "that Israel undertake forthwith not to carry out any further attacks on nuclear facilities in Iraq or on similar facilities in other countries, devoted to peaceful purposes, in disregard of the Agency's safeguards system." This same resolution also requested Mr. Blix, the IAEA Director General, to seek personally from the Government of Israel the undertakings just described and to report on his progress to the 1985 General Conference, which was then to "consider the implementation" of the resolution curtailing certain of the membership rights of Israel.

In the summer of 1985, the U.S. Foreign Aid Authorization bill was enacted with a provision that the funds authorized to be earmarked for voluntary U.S. contributions to the IAEA could be contributed to the IAEA "only if the Secretary of State determines (and so reports to the Congress) that Israel is not being denied its right to participate in the activities of that



Agency." Since, as a practical matter, support by a majority of the Agency's members for adequate funding of safeguards activities has been politically dependent upon companion measures to provide adequate funding of the Agency's technical assistance program through voluntary contributions -- a substantial portion of which are made by the United States -- this posed a serious (if indirect) potential risk to the Agency's ability to carry out its safeguards responsibilities. The Executive Branch then made it clear that if the 1985 General Conference impaired Israel's rights of membership it would walk out of the Agency again.

The Director General's efforts over the Spring and Summer of 1985 resulted in a letter from the Government of Israel that included the following key statements:

Israel holds that all States must refrain from attacking or threatening to attack nuclear facilities devoted to peaceful purposes, and that the safeguards systems operated by the IAEA brings evidence of the peaceful operation of a facility.

It is within this context that Israel reconfirms that under its stated policy it will not attack or threaten to attack any nuclear facilities devoted to peaceful purposes either in the Middle East or anywhere else.

Israel will support any subsequent action in competent fora convened to work out binding agreements protecting nuclear installations devoted to peaceful purposes from attack and threat to attack.

The Israeli formulation did not satisfy the Iraqis, who reintroduced a punitive resolution at the 1985 General Conference. However, the Conference President, supported by the Legal Advisor to the Conference, ruled that such a resolution could be adopted only by a two-thirds majority, since it would deprive a member state of some of its rights of membership. An Iraqi challenge to this ruling was defeated by a sizeable margin, and instead the

Conference adopted a resolution introduced by the Nordic countries which concluded that the Israeli letter provided the requisite assurances called for by the General Conference in 1984.

Thus, this long-festering issue, which threatened to do serious harm to the IAEA and to trigger a crisis of major dimension was put to rest, and the threat of any successful future Iraqi attempts to resurrect it was substantially diminished. However, given the on-going nature of the crisis in the Middle East one cannot eliminate the possibility that moves against Israel might be made again in some other context in the IAEA. As we have noted above at the subsequent meeting of the UN General Assembly that was held in 1985, Iraq was able to secure passage of a resolution against Israel that calls upon the IAEA to take further steps to assure that Israel does not again attack a civil nuclear facility. Iraq can be expected to seek to exploit this UNGA resolution to reopen the issue in Vienna that Israel should be denied some of the privileges of IAEA membership. While hopefully it will be strongly defeated if it pursues the matter there still remains a lingering possibility that the Israeli issue can flair up again in the IAEA. More broadly, there is always the possibility that the atmosphere of political confrontation that became so worrisome a few years ago could arise again in the future. Accordingly, in this section of this report we attempt to address two difficult questions that the United States might conceivably have to cope with at some future point in time. These questions are:

- 1) What would the consequences be if the United States is compelled to walk out of the IAEA once again?

- 2) What alternative safeguards mechanisms could the United States and the balance of the international community turn to, in the event circumstances in the IAEA ever eroded so severely as to throw into jeopardy the entire credibility and utility of the IAEA safeguards system?

These questions still have pertinence to the evolution of future U.S. nonproliferation policy if only because of the value they may have for contingency planning.

Also, an examination of the alternatives sheds light on the issue of whether there really are any practicable options other than the IAEA. As it is, it appears that the United States came perilously close to walking out of the IAEA again without any clear picture of how this would have affected the IAEA in the long-run, where this would have led the United States in its nuclear export policies or how the global nonproliferation regime might be affected. While a U.S. "walkout" might again be justified at some future point in time, it is believed that the foundation of this decision can be improved if one obtains a clearer indication of what the consequences might be, what alternatives might be available and how the achievement of U.S. nonproliferation goals might be affected.

South Africa. The treatment of South Africa has been another recurrent political problem in the IAEA that has threatened to undermine the concept that IAEA safeguards should be applied to all non-nuclear weapon states. Notwithstanding the clear terms of the IAEA Statute under which it had held a seat on the Board of Governors for many years, South Africa has been denied its Board seat since the mid-70s. Also, since then, there have been a number of anti-South African resolutions at IAEA General

Conferences which the United States has voted against. This year, as a significant matter, the resolution on the subject at the September 1985 Conference was relatively mild. The United States did not vote against it, but abstained, which may have helped gain African support for the satisfactory disposition of the Israeli issue. It should be stressed that no attempt was made at the September 1985 General Conference to oust South Africa from its membership in the Agency -- possibly out of recognition of the fact that the Agency is currently negotiating arrangements with Pretoria to apply safeguards to South Africa's commercial uranium enrichment plant.

While these developments tend to substantiate the impression that the atmosphere in the IAEA has moderated -- one cannot rule out the recurrence of some harsh moves against South Africa in the IAEA in the future, especially in light of the violence that now is developing in that country. Accordingly, in a subsequent section of this report we evaluate what the implications might be if the applications of IAEA safeguards in South Africa ever came to a halt due to further alienation of South Africa from the rest of the IAEA membership.

Reappointment of Director General Blix. During the September 1985 General Conference Dr. Hans Blix of Sweden was reappointed Director General of the Agency for a second four-year term. Unlike 1981, when the selection of a Director General was a highly contentious and divisive issue, in which Dr. Blix emerged as a compromise candidate, his reappointment last September won positive support from all groups of members. This has been an encouraging development, since Blix has undertaken impressive efforts to defuse political issues in Vienna and to rebuild the Agency's reputation as a reliable, businesslike, and technically

oriented organization. To the extent this trend continues the prospective durability of the IAEA safeguards system should be strengthened.

Financing of Safeguards. The General Conference also decided to defer for another year any change in the special formula for financing the Agency's safeguards activities, last approved in 1984. Here too, the Agency was able to move forward while avoiding a sharp political division or crisis. However, as we shall comment in a subsequent section of this chapter, the issue of how best to finance safeguards in the IAEA could evolve into a seriously contentious one as future increases in the safeguards budget materialize. In discussing this particular issue we shall review the merits of continuing to perpetuate the current special formula for financing safeguards or of shifting to some alternate regime.

Other Budgetary Matters. On a related matter, the recent General Conference adopted a near-zero growth regular budget of the Agency for 1986. One of the factors making this possible has been the fact that the IAEA technical assistance program is separately financed by voluntary contributions mostly from the industrialized member states. For years the United States has endeavored to keep such funding out of the regular budget and to keep increases in the annual targets for voluntary contributions within reasonable bounds. In this regard, the 1985 General Conference approved "indicative planning figures" for such voluntary contributions for the next three years, limiting to 12% the projected annual growth rate in the target for voluntary contributions. (This figure was a compromise reached after considerable negotiation). Some believe that this action may serve to remove the controversial issue of financing technical assistance from

the agenda of the General Conference for the next several years. On the other hand it seems unlikely that the developing countries in the IAEA will ever accept the proposition that the resources available for technical assistance in the IAEA are fully adequate to meet their needs. This would be contrary to chronic complaints they have had for many years, and therefore some believe tensions between the IAEA safeguards and technical assistance budgets are likely to persist. Also, in the near term there is a good possibility that the The United Nations Conference for the Promotion of International Cooperation in the Peaceful Uses of Nuclear Energy (PUNE), which is scheduled for 1987, could aggravate the problem since the Conference is likely to serve as a sounding board for those nations who may make intemperate demands on the industrialized states for funds, nuclear technologies, and other forms of assistance.

Size of Board of Governors. As another constructive step, the 1985 Conference sidestepped several potential problems posed by initiatives to further enlarge the membership of the IAEA Board of Governors. The United States has been one of those nations which has opposed further Board expansion. The General Conference decided against appointing a working group to consider this subject, but asked the Board of Governors to continue consultations on the matter.

Chinese Voluntary Safeguards Offer. Finally, although no action by the General Conference was involved, the People's Republic of China chose the Conference as a suitable major forum in which to announce its willingness to initiate negotiations on an agreement with the IAEA for the application of IAEA safeguards on some nuclear facilities in China -- as the United States, the Soviet Union, the United Kingdom, and France have previously done.

In many respects the recent shifts that China has made in its nonproliferation policies also bode well for the future of the IAEA and its safeguards system. After years of apparent contempt for the nonproliferation policies of most nations of the world over the past two years China has moved to join the political mainstream by joining the IAEA and by adopting a policy that calls for the application of IAEA safeguards to the nuclear fuels and equipment that it supplies to non-nuclear weapon states.

#### 4.5 CONCLUSIONS

When one considers the worries in recent years that the political atmosphere in the IAEA has been seriously deteriorating, the 1985 IAEA General Conference was relatively successful and constructive. Coupled with the marked success of the Third NPT Review Conference, these two events augur well for the future of the international nonproliferation regime and the ability of the IAEA to carry out its safeguards responsibilities in a more constructive and business like atmosphere.

This raises the question of whether the international community is entering a new positive era in which it can be anticipated that it will be feasible to effectuate improvements in the efficiency and effectiveness of the IAEA safeguards system without fear of a recurrence of some of the divisive political debates that started to dominate matters in Vienna over the last six or seven years.

The authors of this report have no interest in discounting the significance of the positive turn of events of the NPT Review and IAEA General Conferences. However, in fairness, it must be stressed that by characterizing these Conferences as "positive", one really means that two potentially adverse developments were

AC4NC104

avoided. Most critically in Vienna the U.S. avoided a scenario, involving Israel, that probably would have "compelled" the U.S. delegation to walkout of the Conference and presumably refrain from active U.S. participation in the IAEA for months if not indefinitely--bearing in mind that this would have been our second walkout for the same reason.

Similarly, the Review Conference, was gratifying in that a repeat of the stalemate of 1980 was avoided and it was feasible to produce a positive document that was quite supportive both of the NPT in general, and of the IAEA safeguards system in particular.

All of this has been quite constructive in shifting the atmosphere from one of political confrontation to one in which the participants appear to be reaffirming support of their common nonproliferation objectives. In the near term, it would appear that the IAEA is "out of danger" for the immediate future, and that the United States and others have done a very creditable job in encouraging an attitude among a wide number of states -- including many in the developing world -- to the effect that their own national interests are served not only by the IAEA safeguards system but also by the NPT. Also, Mr. Blix undoubtedly should get some credit for the efforts he has made to conciliate the developing countries and to make them feel that they have an important stake in the Agency's future. China's decision to join the IAEA and to require the application of IAEA safeguards on its own nuclear exports also can be regarded as an especially positive step in strengthening the foundation of support that the IAEA safeguards system now enjoys in the international community.

On the other hand, one cannot eliminate the possibility that the atmosphere might change for the worse once again, and in point of fact, there are still some major uncertainties in the picture.

AC4NC104



In the near term, all of the evidence to date suggests that the PUNE Conference could be as disorganized and confrontational in nature as the recent NPT Conference was constructive and positive. While the focus is on peaceful nuclear cooperation rather than safeguards there are distinct possibilities that this affair could reopen some of the North-South issues that were successfully contained this year at the Review Conference and the IAEA General Conference. We are referring here to issues such as the clamor of some LDC's for more technical assistance, and for additional seats on the IAEA Board of Governors, etc. The PUNE Conference also will involve the participation of the states that are not party to the NPT as well as parties to the Treaty and it is quite possible that the non-parties may press for actions that either are hostile to the NPT or to the concept endorsed by the NPT Review Conference, that in their international nuclear dealings all states should work to achieve the acceptance of "full-scope" IAEA safeguards. While it may be feasible to limit any damaging effects to the deliberations of the PUNE meeting itself, recommendations could emerge from that Conference that could have the consequential effect of revitalizing adverse confrontational debates at the IAEA in Vienna. While this all is quite conjectural at this writing and while the PUNE Conference may prove to be a notable "non-event" the signs at this juncture are not promising.

Second, as another worrisome prospect, the NPT runs out in 1995 and its extension is dependent on a majority vote of the parties. While an extension seems very likely, it cannot be assured and some of the non-nuclear weapon parties to the Treaty may seek to obtain some new "concessions" from the nuclear weapon states as a price for agreeing to an extension. While most of the difficulties associated with such an extension most likely will relate to

Article VI of the Treaty (which obliges the parties to pursue good faith negotiations relating to cessation of the nuclear arms race), one cannot eliminate the possibility that issues more directly related to the IAEA and to IAEA safeguards and civil nuclear collaboration might arise. The negotiations related to the extension of the Treaty could be far more difficult than those that were associated with the recent NPT Review Conference since the power and "leverage" will shift over to the non-nuclear weapon states, some of whom are known to believe that the nuclear weapon states have not lived up to some of the basic "bargains" that were anticipated when the NPT was negotiated.

As a third possibility, one cannot rule out the prospect that punitive actions against South Africa and Israel may surface again in the IAEA even though more moderate voices have prevailed in recent months. The authors doubt whether the United States would walkout from the IAEA over an action against South Africa but this is not the case for Israel. Had the United States lost the vote on Israel at the recent IAEA General Conference, the United States undoubtedly would have withdrawn from active participation in IAEA affairs for a protracted period with possible uncertain or adverse effects on the IAEA safeguards system.

While such a protracted U.S. withdrawal from active participation in the IAEA would presumably have represented a serious jolt to the IAEA, (and could still occur at some future time) there is no public indication that an effort has been made to try to calibrate what the political and legal effects might be, and how long the IAEA might "survive" without U.S. involvement. This is not offered as a criticism of the fact that the United States was prepared to walk out from the Agency had a punitive action been taken against Israel last September. However, it should be

interesting in planning future U.S. strategy to try to predict what the effects of another protracted U.S. walk out from the Agency might be as they relate to the potential durability of the IAEA safeguards system. To this end, an effort is made to make such a prediction in the following section of this report. While the Israeli issue appears to have been contained at least for now, it could recur once again and another U.S. walkout could occur as a consequence. We should note that we are focussing on Israel not because of a particular fascination with that country, but because we know of no other close ally of the United States that lives with such a chronic prospect of possible sanctions or ejection in the IAEA. As a matter of principle, however, the United States, in theory, might take a similar step towards withdrawal from the IAEA if it ever concludes that another close ally is being treated in a highly prejudicial and unfair manner. (We place South Africa in a different category than Israel because of its very destructive racial policies and if South Africa were ejected from the IAEA we do not believe that the United States would withdraw from active involvement in the IAEA.)

Finally, even though the IAEA does not appear to be now facing an immediate crisis, there are still other scenarios, as we have noted above, that could threaten the "durability" of the IAEA safeguards system. While all of these fortunately appear to be extremely unlikely at this time it may be useful to try to predict what the consequences and remedies might be if some of them occur. Accordingly, in addition to trying to predict what the likely consequences would be if the United States ever felt compelled to again withdraw from the Agency, the following sections attempt to evaluate what might occur in the event there is a localized breakdown in the application of IAEA safeguards in a particular state (using South Africa and Israel as examples),

and what institutional alternatives might be available if there ever is any kind of "generic" breakdown in the IAEA safeguards system across the board. Expressed in other terms, we examine the issue of whether there really is any credible alternative to the IAEA system since this will have an important bearing on what the long-term "durability" of the IAEA system is likely to be.

#### 4.8 POSSIBLE CONSEQUENCES OF ANOTHER U.S. WITHDRAWAL FROM PARTICIPATION IN THE IAEA.

A second U.S. withdrawal from the IAEA, (because of an action against Israel) would not necessarily compel the United States to promptly adopt some alternate safeguards and inspection device or to abandon use of the IAEA safeguards system to help fulfill U.S. political or legal requirements. More specifically, and with regard to states that are party to the NPT, a U.S. act of withdrawal from the IAEA clearly would not in, and of itself, affect or alter the NPT status of any such state with whom the United States cooperates. The applicable verification agreements that such nations have in force with the IAEA would remain in full force and effect. As a consequence, the U.S. statutory requirements (Section 128 of the Nuclear Non-Proliferation Act of 1978) calling for the application of "full-scope" IAEA safeguards to nations receiving U.S. enrichment services or major reactor components would continue to be satisfied in such cases. Accordingly, it could be argued that even following a U.S. withdrawal from the IAEA, U.S. cooperation with such states could proceed without any disruption if the United States were otherwise satisfied with the apparent effectiveness of the IAEA safeguards being applied.

Similarly, with regard to non-parties to the NPT, a U.S. withdrawal from the IAEA for a protracted period should not necessarily throw into question the on-going validity of the application of IAEA safeguards to those items of U.S. nuclear materials and equipment that have been transferred to such countries. In the case of such "INFCIRC/66-type" countries, IAEA safeguards typically are applied to specific items of supplied and produced materials pursuant to trilateral safeguards agreements between the supplier state, the IAEA and the consuming nation. Trilateral agreements of this character, and covering past transfers of U.S.-supplied fissionable materials or equipment, are in effect with Israel, India, Argentina, Brazil and South Africa. It is understood that United States enriched uranium is still on the inventories of the respective trilateral agreements with each of these nations.

Accordingly, in the case of non-NPT countries with whom the United States has cooperated, as well as NPT parties, a U.S. withdrawal from active participation in the IAEA would not, in itself, result in any automatic cessation in the application of any existing IAEA safeguards arrangements.

On the other hand, a second U.S. withdrawal from the IAEA, could have several adverse effects.

- o First, if the United States disengaged itself from IAEA affairs for a period of many months it obviously would lose a good deal of its ongoing influence in shaping and improving the evolving character of the IAEA safeguards system. While most, if not all, U.S. nationals on the staff of the IAEA Secretariat probably would complete their normal tours of duty most other forms of U.S.

interaction with the members of the IAEA safeguards staff presumably would cease or would be severely curtailed. The United States presumably would no longer participate in IAEA expert groups dealing with safeguards matters and its participation in the Director General's Safeguards Advisory Group (SAGSI) would stop. In order to make its views known or felt in the IAEA, the United States most likely would have to deal through friendly "surrogate" IAEA member states if such states would, in fact, be willing to respond to our influence and be prepared to advocate points that we favored in discussions with the IAEA. Canada might be such a willing partner since it has tended to cooperate with the United States in advocating rigorous safeguards measures in Vienna. However, Canada as well as some other IAEA member states might be reluctant to pursue U.S. objectives too openly or conspicuously so as to avoid creating the impression that it is serving as merely a U.S. mouthpiece. Hence, even with the active cooperation of some friendly allies, U.S. substantive influence over the IAEA safeguards system probably would diminish significantly if the United States avoided active involvement in IAEA matters for a period of many months. (This, however, would not necessarily have any significant adverse effect on the efficacy of the IAEA system if the Secretariat was performing in an effective manner.)

- o Second, as a practical political matter, and in response to a U.S. withdrawal from active participation in the IAEA, the NRC or others might well ask the Executive Branch for additional justification as to why continued

exports under IAEA safeguards would still be in the U.S. national interest since the United States would no longer be in a position to directly shape the manner in which the IAEA safeguards program is conducted. The longer the U.S. stayed away from active participation in the IAEA the more vulnerable the interested Federal agencies would be to challenges from interested public groups that U.S. nuclear exports were imprudent since the United States would no longer have a direct opportunity to assert a positive influence on the IAEA safeguards system. Questions might be raised by the USNRC as well as the Congress as to how the U.S. would be able to form valid, technical or policy judgements about the on-going adequacy of the IAEA safeguards system if it were no longer actively interacting with the IAEA Secretariat or attending the relevant meetings of SAGSI, or the IAEA Board of Governors.

- o Third, if the United States withdrew from active participation in the Agency (because of a new adversarial action that would deprive Israel of the full entitlements of IAEA membership) U.S. contributions as noted earlier, to the IAEA voluntary technical assistance programs (which relates to the provision of experts, equipment, and fellowships) would be terminated if a proviso now attached to the AID Authorization bill were still in force. The Congress might even insist on a reduction in the U.S. contribution to the IAEA assessed budget. The adverse political and operational effects in Vienna of a reduction in U.S. financial contributions to the voluntary technical assistance programs could be considerable. This relates to the critically important fact,

which we already have stressed, that there has been a coupling in the minds of many IAEA member states (and notably the developing countries) between the amounts that are allocated to safeguards under assessed budget and the amounts that are provided voluntarily for the technical assistance program. Since the United States provides the largest contribution to the voluntary fund, a cancellation of U.S. contributions could lead to severe internal pressures in the IAEA including "retaliatory" efforts by other states at cuts in the size of the IAEA safeguards budget. The resources available to the safeguards program could be reduced or threatened at a time when the demands and challenges on the program would be on the increase. The basic point to be made here is that a second U.S. walkout could contribute very adversely in itself to a weakening of the IAEA system depending on how the United States would be compelled or would elect to relate to the IAEA during such a period.

- o Fourth, in the event the United States sharply reduced or eliminated its financial and other material contributions to the IAEA safeguards program, complaints could surface in Vienna that the United States was deriving the benefits (through its nuclear export "program" limited as it now is) of the IAEA safeguards program without adequately contributing to the cost. Nations who already have been proposing formulas for financing safeguards that the United States finds unacceptable, might become even more radical and extreme in their positions; for example, by presenting proposals that the nuclear weapon states should hereafter absorb most of the costs of safeguards. In this regard, one question



that has arisen in the course of preparing this paper is whether it might be feasible in the event of any future U.S. withdrawal from the IAEA for the U.S. to make some on-going specific contributions to the IAEA safeguards budget even if the United States elected not to contribute financially to other IAEA programs. One might argue that in the interest of nonproliferation, the United States should be prepared (in the event of such a hypothetical U.S. withdrawal) to continue to make contributions to the safeguards portion of the IAEA program even though the United States may elect to refrain from participation in other aspects. However, based on informal consultations with the IAEA Secretariat, IEAL has been advised that it would not be feasible under the IAEA Statute for an IAEA member state to make a direct contribution to the support of one program financed by the assessed budget while refraining from contributing to others.

Evidently, contributions made to the IAEA assessed regular budget must be allocated to all programs covered by the regular budget in accordance with the distributions reflected in the regular budget.

- o As still another point, if the United States terminated its financial contribution to the IAEA technical assistance program -- because of another U.S. "walkout" -- serious questions could well be raised by some parties to the NPT as to whether the United States, in essence, was taking a negative action in "default" of Article IV of the NPT. This is due to the fact that the IAEA technical assistance program has become the principal

vehicle for providing assistance in civil nuclear areas to the less advanced nations of the world. Article IV, of course, is the provision of the Treaty that anticipates that (a) the non-nuclear states that are parties to the Treaty will have the right to pursue the peaceful development of nuclear energy; and (b) all the parties will cooperate with each other to facilitate such advances. Notwithstanding the recent successful outcome of the 1985 NPT Review Conference the United States has an obvious interest in not doing anything that would undermine the Treaty's foundations over the next several years in light of the need to renew the Treaty by 1995. However, a second U.S. walkout from the IAEA, between now and 1995 could serve to threaten the Treaty's foundations both in terms of raising anxieties about the future of the IAEA safeguards system as well as sources of funding for the IAEA technical assistance program.

- o Finally, if the United States withdrew from the IAEA, it nominally might deprive itself of the ongoing opportunity to be present in Vienna to help assure that IAEA safeguards are administered in an "objective" as well as technically effective manner.

For example, while the United States has not been able to ward off the political diatribes in Vienna against Israel, it nevertheless has served as a constructive voice and influence in helping assure that when IAEA safeguards are applied they should be administered in a reasonably objective manner without the prospect that any controversial or unpopular member states will be subject to political harassment. A number of years ago,

when U.S. bilateral safeguards were suspended in preference for those of the IAEA, a few nations like Israel expressed concerns to the United States that they should not be politically harassed if they submitted any of their facilities to IAEA safeguards. The point was made that if any serious harassment occurred it should be reasonable grounds for the reactivation of U.S. bilateral controls if the IAEA ever were perceived as abusing its safeguards rights in a way suggesting political discrimination. Within this context, if the United States withdrew from active participation in the IAEA (and over a dispute involving Israel) it is not conceivable that Israel might ultimately withdraw the Nahel Soreq research reactor from under IAEA safeguards on the grounds that Israel stood little chance of being equitably treated in the IAEA -- especially in the absence of a U.S. presence. While the technical safeguards consequences of such an Israeli move would be trivial -- since the Nahel Soreq reactor is only a modest size swimming pool reactor -- the political consequences would be far more serious since, for the first time, a nation would have withdrawn a facility, in protest, from IAEA safeguards. Also, South Africa might be even more inclined than Israel to withdraw its facilities (namely the Koeberg and SAFARI reactors) from IAEA safeguards if a U.S. withdrawal gave it a desired pretext for saying that the IAEA regime was falling apart. While either of these scenarios might strike the reader as very far fetched (especially in light of the recent successful Conferences in Vienna and Geneva noted above) they cannot be ruled out completely if the political atmosphere in the IAEA seriously deteriorates once again.

AC4NC104

when U.S. bilateral safeguards were suspended in preference for those of the IAEA, a few nations like Israel expressed concerns to the United States that they should not be politically harassed if they submitted any of their facilities to IAEA safeguards. The point was made that if any serious harassment occurred it should be reasonable grounds for the reactivation of U.S. bilateral controls if the IAEA ever were perceived as abusing its safeguards rights in a way suggesting political discrimination. Within this context, if the United States withdrew from active participation in the IAEA (and over a dispute involving Israel) it is not conceivable that Israel might ultimately withdraw the Nahel Soreq research reactor from under IAEA safeguards on the grounds that Israel stood little chance of being equitably treated in the IAEA -- especially in the absence of a U.S. presence. While the technical safeguards consequences of such an Israeli move would be trivial -- since the Nahel Soreq reactor is only a modest size swimming pool reactor -- the political consequences would be far more serious since, for the first time, a nation would have withdrawn a facility, in protest, from IAEA safeguards. Also, South Africa might be even more inclined than Israel to withdraw its facilities (namely the Koeberg and SAFARI reactors) from IAEA safeguards if a U.S. withdrawal gave it a desired pretext for saying that the IAEA regime was falling apart. While either of these scenarios might strike the reader as very far fetched (especially in light of the recent successful Conferences in Vienna and Geneva noted above) they cannot be ruled out completely if the political atmosphere in the IAEA seriously deteriorates once again.

4-30

AC4NC104

## 5.0 ARE THERE CREDIBLE INSTITUTIONAL ALTERNATIVES TO IAEA SAFEGUARDS?

### 5.1 INTRODUCTION

In the event serious difficulties affecting the IAEA safeguards system materialize, the durability of the system is likely to depend, in part, on how readily an alternate safeguards regime could be devised, activated, and relied on to deal with the problems at hand. As is well recognized, for several years now the Agency's safeguards system has served as the central international mechanism for verifying compliance with the NPT, numerous bilateral supply arrangements, the Treaty of Tlatelolco, several so-called IAEA project agreements, as well as some voluntary safeguards agreements covering prescribed civil nuclear facilities in the United States, the U.K., and France. Moreover, only some supplier countries possess so-called "fall-back" rights in their nuclear supply agreements that would provide for the reactivation of bilateral safeguards in the event the IAEA system were judged to be no longer a satisfactory mechanism for applying safeguards.

Under these circumstances the conclusion might be reasonably drawn that there is no acceptable alternative to the IAEA safeguards system and that the IAEA system simply has to be made to work -- or else the entire non-proliferation regime will become unhinged as will many international arrangements for nuclear trade and cooperation. This most likely will be the strong

policy position of several member states of the IAEA, and it can be assumed that the great majority of the nations around the world, including most major supplier nations, will strongly argue that a move to adopt other safeguards mechanisms or even a serious consideration of some other alternatives to the IAEA is too unrealistic politically and far too fraught with difficulties to merit any kind of serious attention.

The problem with this approach is that it does not really prepare one for the possible eventuality, however remote and undesirable, of turning to alternate remedies if the IAEA system does, in fact, fail for any reason. Also, a failure to examine alternatives deprives the policy planner of some perspectives as to how critically essential it really may be, to try to preserve the IAEA system. As a related matter, the question arises as to whether the activation of any alternate safeguards mechanisms could usefully serve the IAEA system in any fashion.

With these considerations in mind this section of the report briefly considers some hypothetical alternatives to IAEA controls.

## 5.2 FACTORS GOVERNING POSSIBLE DESIRABILITY AND FEASIBILITY OF ALTERNATIVES

In evaluating the conceptual "alternatives", to IAEA safeguards, that theoretically might be available it is useful to consider the following:

- ° What does the "triggering event" arguing for a switch from, or substitution for the IAEA really call for? The circumstances will differ if the system ceases to

AC4NC104

be viable in just one country for political reasons or if there is a serious deterioration in effectiveness or viability across the board. If the problem is limited and is country-specific, one presumably will not feel the need to develop some new institutional alternatives. However, the incentive to develop or consider new alternatives could be considerable if there appears to be a serious and irreversible process of deterioration in Vienna.

- o What are the desired attributes of a possible alternative safeguards mechanism or mechanisms to the IAEA? (What criteria would a substitute mechanism most likely have to meet to be acceptable to the United States or more broadly to other supplier states as well as to consumer nations? Is there, for example, an inherent advantage in turning to multilateral rather than bilateral alternatives should the IAEA system break down in a general way for any reason?)
- o What relative freedom of action would the United States have in order to bring a given alternative into effect? and
- o Adding these factors together how credible is the proposed alternative to IAEA safeguards really likely to be?

These various elements are dealt with in the discussion that follows.

### 5.3 TRIGGERING MECHANISMS

For analytic purposes we have considered three types of "triggering" scenarios, which might call for the activation of some alternate safeguards mechanisms. While they may strike the reader as far fetched, they are designed to illustrate the range of situations that at least in theory might compel the United States and other nations to search for some alternate safeguards arrangements to the IAEA.

#### 5.3.1 Withdrawal Of A State From IAEA Safeguards

Under one scenario the IAEA safeguards system might break down due to a refusal by a given state to submit any longer to IAEA safeguards because of political considerations. As reflected by our earlier discussion, either South Africa or Israel conceivably might refuse to accept IAEA inspectors at some future point in time in retaliation for being excluded from IAEA activities or benefits, because of alleged politically inspired discriminatory "abuses" in the manner in which IAEA safeguards are carried out, or because one or both of these nations had concluded that it could no longer be treated objectively in such a multinational organization due to the seriously adverse political attitudes of most of the other members. If such events ever occurred and if near term reconciliation with the IAEA seemed impossible, one question that would arise would be whether it would be desirable and feasible to persuade these countries to submit to some alternate externally applied safeguards arrangement (such as bilateral controls administered by a nation such as the United States).



### 5.3.2 Serious Deficiency In Resources Or Ability To Perform Selected Functions

Under a second scenario which is discussed here, the IAEA simply may not have sufficient technical, financial and material resources to perform an efficient and credible safeguards operation in one or more specific country situations or for a class of facilities that require a highly intensive application of safeguards resources, such as reprocessing and fuel fabrication plants that process large volumes of weapons usable materials. The issue would not be one of not knowing what to do, but rather of not having sufficient IAEA resources to do the job in a credible fashion. As a consequence, there might be delays in obtaining supplier state (read the United States) approvals, when needed, of reprocessing operations or retransfers of spent fuel or of separated plutonium to such plants. The issues that would be posed would be whether it would be desirable and feasible, in such an instance, to supplement the IAEA's activities with the applications of some concurrent additional safeguards mechanisms, such as the use, on a bilateral basis, of additional inspectors appointed by a supplier state.

### 5.3.3 Catastrophic Breakdown

Under the third scenario (which in essence would involve the "unthinkable") matters in the IAEA would deteriorate so severely at both political and technical levels as to compel the United States, on its own or in conjunction with other interested countries, to seek to activate some alternate major safeguards mechanism on an interim or long-term basis. The situation would have degraded so seriously in Vienna to require identification of some alternate institutional approach both for nonproliferation

reasons and to enable international nuclear commerce to continue.

Any one of these scenarios would, of course, represent a significant setback to the durability and credibility in the IAEA safeguards system, but they would differ in severity. The first example would involve a setback in achieving the broad, and hopefully universal, application of the IAEA safeguards system to all countries. It would materialize because matters had become so political and adversarial in the IAEA as to make it infeasible to sustain relationships with one or more highly controversial countries. However, the technical efficacy of the IAEA system would not necessarily be in doubt from an overall standpoint and the system would operate reasonably well in other country specific situations. The second example would involve an operational breakdown in the administration or technical application of a part of the safeguards system due to some acute shortages of IAEA resources to deal with specific problem situations credibly. If it were feasible to bring "supplementary" inspection mechanisms to bear on the process, this presumably would be for a limited period until the IAEA could obtain the requisite funds and resources to perform the job on its own effectively. The third scenario visualizes that matters would have eroded so badly in general in Vienna as to call for the use or establishment of some totally new institutional mechanisms.

#### 5.3.4 Withdrawal By Some States From IAEA Safeguards

A decision by either South Africa, Israel or any other nation to withdraw facilities from IAEA safeguards could have very adverse effects on the IAEA, but there might be remedies available for preserving some continuity in the application of external safeguards to the materials and facilities involved in such countries.

AC4NC104

As a factual matter, Israel only has one facility, the Nahel Soreq swimming pool reactor, under IAEA safeguards, and it has no nuclear supply agreements in force with any other country. South Africa has nuclear agreements for cooperation in effect with the United States and France as well as trilateral agreements in effect with the IAEA and these countries that subject the SAFARI research reactor as well as the Koeberg nuclear power plant to IAEA safeguards. For several years now the United States has refused to export nuclear fuels to South Africa due to policy and legal considerations. Under the Nuclear Non-Proliferation Act (and in the absence of a Presidential waiver) U.S. nuclear fuel supply to South Africa can not occur until that nation accepts "full-scope" IAEA safeguards coverage which it has steadfastly refused to do. More recently President Reagan has issued an Executive Order essentially banning all civil nuclear collaboration with South Africa with the exception of assistance (a) in support of generally available IAEA programs and of IAEA safeguards; or (b) judged by the Secretary of State to be necessary for humanitarian purposes.

One question that might arise for the United States if either Israel or South Africa refused to continue to accept IAEA inspections on safeguarded facilities would be whether either or both of these countries would be in non-compliance with an IAEA safeguards agreement and thus would be subject to the "sanctions" referred to in Article XII of the IAEA Statute as well as those called for in Section 129 of the U.S. Nuclear Non-Proliferation Act, etc. Although either Israel or South Africa could terminate their trilateral safeguards arrangements with the IAEA after appropriate notice, the trilateral safeguards agreements that each of these countries have entered into provide that the safeguards on the nuclear materials supplied [or on special fissionable

AC4NC104

material produced, processed or used in connection with supplied nuclear material] shall persist until such time as the Agency has terminated the application thereto, in accordance with the provision of paragraph 26 or 27 of INFCIRC/66\*. This is a principle that the United States has long endorsed and one that the Board of Governors explicitly adopted in approving GOV/1621 on August 20, 1973. It also should be noted that in an exchange of notes in April 1977 and on the occasion of the expiration of the U.S.-Israel Agreement for Cooperation of July 12, 1955, Israel explicitly recognized the continuing effect of the safeguards and guarantee provisions of the Agreement for Cooperation. This included appropriate understandings that Israel would continue to honor the terms of the trilateral safeguards agreement dated April 4, 1975 that the United States, Israel, and the IAEA had previously concluded.

Within this context, if either Israel or South Africa refused to allow IAEA inspectors to inspect materials and equipment that the IAEA still judged to be technically under safeguards, there could well be assertions in the IAEA Board of Governors, the General Conference, and elsewhere that these nations had breached their safeguards agreements. Opponents of these countries could seek to invoke the provisions of Article XII of the Statute to call for a direct curtailment or suspension of IAEA assistance to

---

\*As a variant the trilateral agreement between France, the IAEA and South Africa provides that the agreement shall remain in force until the IAEA Secretariat terminates the safeguards arrangements on the materials and equipment involved.

AC4NC104

these countries, a return of materials (where applicable) and possible suspension of these countries from the privileges and rights of membership. The United States then would have to decide whether it should join in these actions of censure.

The position that the United States would take on any censuring actions against Israel or South Africa would depend, at least in part, on how valid we judged their rationales and claims to be that they had reasonable grounds for refusing further access to IAEA inspectors. Undoubtedly political considerations also would weigh heavily in the process and we obviously would be far more prone to be supportive to Israel's interests than to South Africa's. While technically these countries might be in non-compliance with their IAEA safeguards agreements they might be on solid grounds for refusing to comply if they could make a convincing argument that the IAEA Secretariat had abused its rights and was not administering safeguards in either country in an objective manner. In this situation, even the United States might be prone to agree that the problem needing correction was more in the IAEA than in the behavior of either of these countries. However, if either country could not make a credible argument to this effect the situation that the United States and others would face would be far more messy.

If it appeared politically impracticable to bring the IAEA safeguards back into effect in these countries in any near term time frame, the issue would arise as to whether it would be feasible to preserve some continuity in the application of externally administered safeguards to the facilities involved by having the United States or some alternate state (such as France) apply bilateral safeguards. If the IAEA was unable to continue to apply safeguards in either country, the United States would have

AC4NC104

a reasonable basis for reactivating its bilateral safeguards rights in either country. In the exchange of notes with the United States in April of 1977, Israel agreed that the safeguards and the guaranty provisions in the U.S.-Israel Agreement for Cooperation endured even after the lapse of the agreement. The United States accordingly, would have a basis for reactivating the application of U.S. bilateral safeguards rights to the Nahel Soreq reactor and U.S. enriched uranium that has been supplied to that facility.

Similarly, since the U.S.-South African Agreement for Cooperation will not expire until 2024, the U.S. would appear to have a basis for reactivating U.S. bilateral safeguards on the South African SAFARI reactor in the event the IAEA was no longer able to function in that country. It presumably would be up to France to develop modalities with South Africa, that might permit the application of French bilateral safeguards to the French supplied Koeberg power reactor in lieu of IAEA safeguards.

Before it took any such step to reactivate bilateral controls in either South Africa or Israel, the United States would have to carefully weigh the merits of taking this step in contrast to devoting its energies in trying to overcome the objections these nations might have to continuing to accept IAEA inspectors. It seems likely that we would only seek to activate our bilateral controls if we judged that the continued use of the IAEA would be impracticable.

The actual activation of bilateral safeguards arrangements by either the United States or France to South Africa might create some adverse political reactions in Washington or in Paris if such special safeguards arrangements were misconstrued as

undercutting the IAEA or as representing an indirect way of cooperating with, or in "legitimizing" the South African nuclear program. In the U.S. case, it would have to be clearly understood that the activation of bilateral safeguards in South Africa would not, in itself, constitute a violation of any U.S. regulations or any ban against U.S. nuclear cooperation with that country. This might not be a problem since the current Executive Order that serves to severely restrict U.S. nuclear cooperation with South Africa provides some leeway for cooperation when it is in support of international safeguards activities and presumably this philosophy would be extended to the application of fall-back bilateral U.S. safeguards as well.

It is conceivable that if the United States sought to apply bilateral safeguards to either Israel or South Africa as a substitute for IAEA controls some of the states that are hostile to these countries might accuse the United States as undermining the spirit if not the letter of Article III of the NPT which identifies the IAEA as the only safeguards organization to apply safeguards to exports by parties of nuclear materials and related equipment to non-nuclear weapon states. However, since the United States would be filling a specific void left by the IAEA, it should be able to make the point that it is doing nothing, in overall concept, to undermine the overall application of Article III 2 of the Treaty.

5.3.5 IAEA Lacks The Technical Or Material Resources To Adequately Safeguard A Major Program Including Some Major Sensitive Bulk-Handling Facilities

Under the second hypothetical scenario noted above, the IAEA system would "breakdown" in a few instances because of financial

AC4NC104

and material limitations in Vienna rather than political factors. This scenario is not intended to cover the case of a U.S. withdrawal of participation, with a consequent loss of some 27% of the IAEA's financial resources, since such withdrawal would be precipitated by a political event or judgment which would raise other and more fundamental questions as to the U.S. willingness to continue to rely on IAEA safeguards without U.S. participation in their management and execution. The technology would be reasonably well in hand to perform most safeguards functions fairly adequately. However, due to an erosion in resources and manpower or an inability to keep up with an unexpected increase in workload, the IAEA would be unable to perform satisfactorily in safeguarding some of the activities in the more advanced states and most notably at large scale reprocessing or plutonium-uranium fuel fabrication facilities. The problem would be sufficiently serious to hold up supplier state approval (the U.S., or Canada or Australia) of certain transactions subject to so-called consent rights under various bilateral agreements that these countries have with consuming nations.

Here too, one would witness a serious threat to the credibility of the IAEA system and the issue to be addressed would be whether it would be desirable and practicable to visualize arrangements -- of an interim nature -- that would contemplate the activation of supplementary and concurrent bilateral safeguards measures to the facilities involved to help make up for whatever deficiencies or limitations in resources might be impairing IAEA operations.

It could be argued that this could be a reasonable, albeit very remote, scenario since there might be circumstances in which an



AC4NC104

unplanned for, or uncontrollable shortfall or deficiency in IAEA technical resources might call for the infusion of some such supplementary aid and assistance. It also could be argued that the fall-back provisions in at least some U.S. bilateral agreements would permit such partial supplementary measures to take place since they visualize that U.S. bilateral safeguards rights will be suspended in favor of the application of safeguards administered by the IAEA only to the extent that the IAEA is able to perform this task effectively.

However, in practical terms one can visualize very substantial difficulties in implementing a scenario along these lines. Some of the problems that might be encountered would include the following:

- o There would be political resistance by many countries to the idea of reactivating bilateral controls while the IAEA system still is being applied to their activities. Most of the industrialized non-nuclear weapon states that might be involved in such a scenario (Japan and members of Euratom) already have their programs under full-scope IAEA safeguards and they are known to have a strong aversion to the concept of submitting to overlapping or dual safeguards arrangements. While the non-nuclear weapon states that are members of EURATOM have somewhat grudgingly accepted dual IAEA/EURATOM controls as a consequence of their adherence to the NPT, they can be expected to resist the involvement of any third external body that would be conducting an inspection function. Similarly, as a party to the NPT, Japan could be expected to argue that it should be subjected to only one external inspection regime, namely

AC4NC104

IAEA safeguards, and that the imposition of any additive external inspection regime, (even if only for a temporary period) should be avoided or simply is unacceptable. As a corollary of this point of the view, strong arguments could be expected to the effect that the application of some supplementary bilateral inspection procedures concurrently, with the application of IAEA controls could create a very harmful precedent that could serve to undermine the IAEA system.

- o Furthermore, the point undoubtedly would be made that if there are any acute limitations and shortages of needed IAEA safeguard resources it would be better and more supportive to the existing nonproliferation norms to rectify them in Vienna then to seek to activate some supplementary measures involving a third party that could be viewed as a possible first major step to the ultimate phase out of the IAEA system.
- o Also, it could be visualized that operational problems could be encountered if a U.S. safeguards group were activated to apply some concurrent and supplementary measures to a safeguarded facility that technically continued to remain under IAEA safeguards. It would have to be determined for example, whether, and to what extent, the IAEA could, in fact, cooperate with such a supplementary bilateral inspection force, share its work plan and findings and possibly collaborate with such a bilateral team in carrying out joint inspections. While such cooperation presumably would be feasible if the state being inspected were agreeable to such an arrangement it is likely that strong opposition

would be voiced to the idea by some quarters in the IAEA Secretariat and the Board.

Accordingly, the activation of this scenario would appear to be a highly unlikely possibility. Rather, if perceived but limited shortfalls were seen in the IAEA safeguards resources the United States most likely would endeavor to work urgently with the others in correcting the situation in the IAEA before considering any significant alternatives.

#### 5.3.6 Probable Irreversible Breakdown In The IAEA System

Under this essentially worst case scenario the United States would seek to activate some alternate safeguards regime on the grounds that the IAEA no longer is capable of performing a credible safeguards function. Presumably a combination of several negative factors, that have been identified earlier in this report, would lead to such an extreme conclusion. There could be a rampant growth in the politicization of the IAEA which might be typified by the following developments: a seriously exaggerated tendency to bring extraneous confrontational political issues and bloc voting tendencies into the deliberations of the IAEA Board of Governors and General Conference, exclusion of Israel from the full entitlements of membership, the election of a new Director General (possibly from a lesser developed nation) who might strongly favor LDC interests and attitudes at the expense of reasonable support of the safeguards program, an expansion of the IAEA Board of Governors which would pass control to interests that are relatively hostile or cool to safeguards objectives, and perhaps most importantly, clear signs that the technical performance of the IAEA safeguards system has deteriorated so badly as to make it imprudent to rely on the IAEA

systems as a central verification mechanism. As part of the process of deterioration, the U.S. Executive Branch would find itself in circumstances where it could not rely, to any significant degree, on the IAEA safeguards system as an important vehicle for verifying the use of U.S. nuclear exports. It also most likely would not be feasible to obtain the requisite funds from Congress to sustain meaningful U.S. involvement in the Agency.

It seems unlikely that many of these developments would evolve over the same period of time, some obviously are farfetched in nature, and hopefully none of them ever will occur.

Nevertheless these are examples of the kinds of circumstances that might be judged to be sufficiently grave to warrant prompt examination and possible use of an alternative safeguards mechanism or mechanisms.

#### 5.4 REVIEW OF THE ALTERNATE SAFEGUARDS MECHANISMS - INCLUDING DESIRED ATTRIBUTES

##### 5.4.1 The Major Options

In the event the United States concluded that some alternate safeguards mechanism to the IAEA had to be pursued, the following kinds of options might be considered:

- o The United States might seek to reactivate the safeguards rights that it possesses in its bilateral agreements for cooperation with other nations. (This would not be a feasible option for all U.S. bilateral agreements since the United States does not possess such

AC4NC104

explicit bilateral safeguards rights in its Agreements for Cooperation with EURATOM. More will be said about the special case of EURATOM below.)

- o The United States might seek to promote the concept of establishing additional multilateral regional safeguards bodies beyond EURATOM. This might entail (a) promoting the concept of a regional inspectorate for Latin America or the Western Hemisphere structured around the Treaty of Tlatelolco (b) possibly seeking to broaden the scope of the European regional safeguards system (which now only covers the European Community) by encouraging the OECD Nuclear Energy Agency to establish a companion system for the non-EURATOM member states of the OECD; and (c) examining the feasibility of establishing regional safeguards groups in the Far East, South Asia and the Middle East.
- o The United States might join with others in endeavoring to form a new international (as contrasted to regional) organization that would be global in its scope in terms of involving differing political and ideological attitudes and regions of the world. The membership initially might be confined to the principal nuclear supplier and consumer states or those likely to achieve this status in the next decade or so. Countries not engaged in major nuclear supply operations, or in nuclear power programs or in significant research reactor operations would not be expected to join. Under this option, a new broadly based international inspectorate would, in essence, be established to replace the IAEA. The theory would be that the organization

AC4NC104

involved most likely would be more business-like in its operations if membership generally was limited to nations with significant nuclear power or civil nuclear R&D programs.

- o As a variant of the idea just noted, the United States might seek to modify the IAEA Statute to separate the IAEA's safeguards responsibilities from it's more "promotional" programs such as technical assistance, advisory service in health and safety, information exchange and development of guidelines. The idea behind such a change would be that it nominally would eliminate the competition for budgetary resources between the IAEA safeguards function and other IAEA activities. Some have also argued, in the past, that the objectivity and credibility of the IAEA safeguards system would be enhanced if the safeguards function were split off from the IAEA's more "promotional" activities.

Several of the options just noted, would involve the establishment of new or modified institutions. In addition, in the event of some serious generic breakdown in the IAEA system, ad hoc measures of an interim nature could be adopted while explorations take place to devise longer-term solutions including possible rectification of the situation in Vienna. For example, the activation of U.S. bilateral controls could take place on an interim basis while the United States decided, on the basis of consultations with others, on what its longer range policy should be. Similarly, in the event of a generic breakdown in the IAEA, several key supplier states (in agreement with the concerned consumer nations) could establish an ad hoc joint inspection

force comprised of their nationals to cover their needs in the interest of allowing urgent international nuclear cooperation and commerce to continue while any longer range solutions are pursued.

#### 5.4.2 Issues Associated With Reverting To U.S. Bilateral Rights

At first glance, if the United States wished to replace the IAEA safeguards system with an alternative verification system that would be applicable to the nuclear fuel and equipment that the U.S. exports, the "easiest" remedy would be to reactivate the bilateral safeguards rights in all U.S. agreements for cooperation that incorporate such rights. At least in theory the United States could move in this direction on its own regardless of whether other suppliers would be prepared to take a similar step. The United States has fall-back bilateral safeguards rights in all of its agreements for cooperation with non-nuclear weapon states except with EURATOM. The prevailing U.S. theory is that the basic U.S. bilateral safeguards rights, including rights of inspection, are set forth in the Agreement for Cooperation and that implementation of these rights is suspended in favor of the IAEA to the extent and so long as the IAEA carries out its functions in an effective manner. On closer examination, however, it appears that the reactivation of U.S. bilateral safeguards rights could present the United States with a number of problems especially if it elected to try to take this step on a wholesale basis and without at least some parallel action on the part of other major suppliers. Moreover, even if several suppliers favored the reactivation or pursuit of bilateral controls, one can anticipate that several difficulties could arise.

AC4NC104

- o First, as a practical political matter, it most likely would be difficult, if not impossible, for the United States to reactivate its bilateral safeguards in a cooperating country like Japan that is party to the NPT unless that country was fully agreeable to this action and shared the U.S. view that the IAEA system was no longer credible. This would be especially true if the IAEA was still involved in the application of safeguards, to the apparent satisfaction of a number of countries. While technically the United States might have the unilateral right in most of its agreements to reactivate bilateral safeguards it obviously could move in this direction only if the State being safeguarded was prepared to receive U.S. inspectors.

To achieve a reactivation of bilateral safeguards the United States could, of course, seek to apply pressure on the cooperating state by various measures including withholding exports of U.S. enriched uranium, or U.S. approvals required under various "consent" rights in certain U.S. agreements for cooperation. Depending on the circumstances such U.S. actions could create significant difficulties for some nations that still rely heavily on U.S. assistance or still have a substantial amount of nuclear material subject to U.S. consent rights. However, by seeking to exert such pressure the United States might do more damage to itself than to others when one recognizes that there are several other suppliers of enrichment services and other forms of nuclear assistance that have been eager and successful in being able to displace the United States as a major nuclear supplier. Also, it should be stressed that the



AC4NC104

percentage of foreign nuclear material that has been subject to U.S. consent rights has been steadily diminishing and U.S. nuclear "leverage" per se' is a fast wasting asset.

Adding all of these factors together, a United States move to reactivate U.S. bilateral controls, especially in states that are parties to the NPT probably would be dependent, in the ultimate analysis, on (a) the ability of the United States to persuade other nations as to the reasonableness of the U.S. position and why it is no longer feasible to rely on the IAEA system and (b) a broad mutual consensus that circumstances warranted having the United States reenter the picture.

- o The reactivation of U.S. bilateral safeguards rights also might prove difficult in the case of countries that are not NPT parties but that have received U.S. nuclear materials and equipment in the past. While the political and legal commitment of such countries to accept IAEA safeguards is less binding and inclusive than those accepted by parties to the NPT, such non-parties also could adopt a tough line in opposition to the reactivation of bilateral controls if the IAEA safeguards were still being applied in a number of other countries. Moreover, in several such cases the United States would not have the purported "leverage" of U.S. nuclear supply to bring these countries around to its point of view. For example, at the present time, Spain is the only non-nuclear weapon state outside the NPT that is under full scope IAEA safeguards and hence eligible to receive U.S. enrichment services.

o As another consideration, it should be noted that the conditions for reactivating bilateral U.S. safeguards rights are not uniform in all U.S. agreements for cooperation. While in all cases (except EURATOM) it would appear that bilateral safeguards are suspended in favor of IAEA controls only so long as the United States is satisfied with the operation of IAEA safeguards, there are differences in how this is expressed in different agreements which could affect the ease with which the United States could press its case that its bilateral safeguards rights should be reactivated. In some cases, the U.S. would appear to have a broad flexibility to step back in the picture if it judges that IAEA safeguards are not being administered effectively. In other cases the language is less explicit although in each case it appears that the United States has to be satisfied with the IAEA safeguards being applied for a suspension of bilateral safeguards to remain in effect.

o To elaborate this point further, some of the earlier U.S. agreements for cooperation appear to accord the United States the clear right to unilaterally activate bilateral controls if circumstances so require. They include language along the following lines from the U.S.- Brazilian Agreement for Cooperation of September 20, 1972:

"A. The Government of the United States of America and the Government of the Federative Republic of Brazil note that, by an agreement signed by them and the International Atomic Energy Agency on March 20, 1967 the Agency has been applying safeguards to materials, equipment and facilities transferred to the jurisdiction of the Government of the Federative Republic of Brazil under

the superseded Agreement. The Parties, recognizing the desirability of continuing to make use of the facilities and services of the International Atomic Energy Agency, agree that the Agency safeguards shall continue to apply to materials, equipment and facilities transferred under the superseded Agreement or to be transferred under this Agreement."

- "B. It is contemplated that the continued application of Agency safeguards pursuant to this Article will be accomplished as provided in the above-mentioned trilateral agreement among the Parties and the Agency, as it may be amended from time to time or supplanted by a new trilateral agreement. It is understood that, without modification of this Agreement, the safeguards rights accorded to the Government of the United States of America by Article XI of this Agreement will be suspended during the time and to the extent that the Government of the United States of America agrees that the need to exercise such rights is satisfied by a safeguards agreement as contemplated in this paragraph." (Emphasis added.)

As noted, the underlined language above makes it clear that the U.S. bilateral rights are being suspended only to the extent that the United States "agrees" that the need to exercise such rights is satisfied by an IAEA safeguards agreement. If and when the United States withdraws its agreement its bilateral safeguards rights are reactivated.

In some other agreements for cooperation, the ability of the United States to unilaterally reactivate bilateral safeguards is expressed in a far briefer manner.

For example, under the terms of Article XI of the U.S.-Japanese Agreement for Cooperation the paragraphs setting forth the bilateral safeguards rights of the United States are introduced by the following clause:

"In the event that International Atomic Energy Agency safeguards acceptable to the Government of the United States of America are not applied as provided in Article XII, the Government of the United States of America, notwithstanding any other provisions of this Agreement, shall have the following safeguards rights."

More recently, the U.S.-Swedish Agreement for Cooperation that entered into force in April 1984, includes the following provision:

"4. If the United States or Sweden becomes aware of circumstances which demonstrate that the IAEA for any reason is not or will not be applying safeguards in accordance with the appropriate agreement referred to in paragraph 2 or 3, the parties shall immediately enter into arrangements which conform with IAEA safeguards principles and procedures and to the coverage required pursuant to those paragraphs, and which provide assurance equivalent to that intended to be secured by the system they replace. These arrangements shall be effected by agreement, other than the appropriate agreement referred to in paragraph 2 or 3, providing for application of safeguards by the IAEA. If either party considers that the IAEA is unable to apply such safeguards, however, safeguards shall be applied under bilateral arrangements.

In some respects this latter clause appears to be more complicated than the formulations in earlier U.S. agreements since it seems to contemplate that if the Swedish NPT Agreement falls away one will first try to establish a new IAEA safeguards arrangement before one reverts to bilateral controls. Also, before U.S. bilateral safeguards could be activated the U.S. would have to make a determination that the IAEA is "unable" to apply its safeguards to the activities involved. This might be a harder criterion for the U.S. to meet for reactivating bilateral controls than making a judgment that such safeguards were not being applied in a satisfactory manner.

The important point to be reemphasized here is that the clauses for "reactivating" bilateral controls vary between different U.S. agreements for cooperation and while the United States may feel that it has a unilateral right in each case to reactivate bilateral safeguards the interpretation of the other parties as to how the "fall-back" provisions of U.S. agreements can and should be reactivated may differ from case to case. As a practical matter, and as already stated, most partners of the United States are likely to accept the application of fall-back U.S. bilateral rights only if it is clear that all efforts to maintain the viability of the IAEA system have failed.

As another major consideration before activating bilateral safeguards the U.S. Executive Branch and the Congress would have to be satisfied that the United States is operating on a sound legal basis and is not comporting itself in a way that suggests that it is violating either Article III 2 of the NPT or the provisions set forth in Sections 127 and 128 of the U.S. Nuclear Non-Proliferation Act. As already noted, Article III 2 obliges the parties, including the United States, not to export source and fissionable materials and related equipment unless IAEA safeguards apply to the activities involved. Sections 109b, 127 and 128 also provide that exports only can take place pursuant to IAEA safeguards. Exports pursuant to Section 109b require that IAEA safeguards apply to the specified activities involved. Further, in accordance with the terms of Section 128, major components as well as source and special nuclear material

AC4NC104

(fissionable material) may be exported (barring a Presidential waiver) only if the cooperating nation has submitted its entire civil nuclear program to "full-scope" IAEA safeguards.

There is no explicit provision in either the NPT or the NNPA for the application by the United States of bilateral controls if IAEA safeguards are not judged to be adequate for any reason. Hence, a U.S. action that sought to substitute U.S. bilateral safeguards for IAEA safeguards possibly could be open to legal challenge in the United States if a number of other governments were of the view that the IAEA still was capable of doing a reasonable job. On the other hand, fall-back bilateral safeguards have been an integral part of most U.S. agreements for cooperation for two decades and the agreements probably would not have survived before the Congress had such fall-back rights not been included. Nevertheless, it is assumed that if the U.S. made a move to reactivate bilateral controls the situation in the IAEA would have to be so grave as to require the involvement or approval of the President as well as close consultations with the Congressional leadership.

It also should be noted that if the United States were to reactivate bilateral safeguards they would be confined in most United States agreements, as a matter of right, to items of nuclear fuel and equipment transferred pursuant to the agreement for cooperation and to subsequent generations of plutonium derived therefrom. Unless the United States was, in essence, supplying fuels and equipment to practically all of the facilities in a foreign program it most likely would not be accorded a right or opportunity to apply its safeguards to all of the country's nuclear activities. Possible exceptions might include Taiwan where the United States has maintained a special nonproliferation relationship.

5-26

AC4NC104

With a failure of the IAEA, some other mechanism would have to be identified to achieve the application of "full-scope" safeguards.

As a further point, if the United States sought to reactivate its bilateral safeguards rights in all or most of its bilateral agreements it would have to decide what kind of relationship it would wish to establish with EURATOM. In contrast to all other U.S. agreements for cooperation, save the pending U.S. nuclear power agreement with China, the United States does not have explicit bilateral rights in its agreement with EURATOM to perform such safeguards functions as the review of plant design, the receipt and analysis of reports, and the inspection of facilities. Rather, under the Agreement for Cooperation the basic safeguards responsibility is delegated to EURATOM. However, the Agreement provides for exchanges or visits and at the time the Agreement for Cooperation was negotiated it was visualized that this provision would provide the United States with the possibility to perform periodic audits that the EURATOM system was working effectively and in accordance with general concepts set forth in an Annex to the Agreement.

After the U.S.-EURATOM Agreement came into force a Joint Technical Working Group to help administer this clause was set up. However, after a relatively brief period it fell into disuse. This has not posed a serious issue to date since, as a consequence, of their adherence to the NPT, the non-nuclear weapon states of EURATOM have been subjected to joint IAEA-EURATOM safeguards and this has served to soften the complaint of some states that the EURATOM system, in essence, involves self-inspection. The situation, however, would be altered considerably if the IAEA system ceased to function in the European Community and the United States would have to decide how actively, (if at all) it

AC4NC104

would seek to audit for itself the performance of the EURATOM safeguards system which presumably would still remain in operation. For example, in the event the IAEA system collapsed the United States could attempt to adopt a more aggressive policy in carrying out the audit and visit provisions in the U.S.-EURATOM Agreement so as to achieve a higher degree of precise information as to how the EURATOM system was being implemented. However, there is little likelihood that EURATOM would be willing to interpret the existing U.S.-EURATOM Agreement for Cooperation so broadly as to permit the United States to conduct independent safeguards inspections and measurements at EURATOM facilities.

As another major problem associated with the activation of fall-back safeguards, the United States might be criticized by other suppliers as well as consumers if it triggered the application of bilateral safeguards as a general policy on the grounds that this would create an undesirable precedent. Nations might agree with us (assuming highly adverse circumstances in the IAEA) that a new safeguards mechanism is needed to substitute for the IAEA but many are likely to resist a solution under which various suppliers would apply concurrent bilateral controls. Most cooperating countries are likely to argue that bilateral safeguards would be inherently undesirable since they are likely to be duplicative and burdensome on the consumer states. Accordingly, in the event of a serious and apparently irreversible breakdown in the IAEA, other countries probably will press for the establishment of some international or multinational safeguards organization. This could involve having one international inspectorate or several regional groups undertake the responsibility for verifying compliance with supply agreements or nonproliferation treaties. In the first instance most can be expected to try to reform or rectify the situation in the IAEA.



It also should be noted that even though the United States has nominal bilateral fall-back rights in most of its agreements it does not have an organized inspectorate available on a stand-by basis to carry out any bilateral safeguards. If such a program were to be really activated the U.S. would have to quickly organize an inspection staff and address how it should be funded.

Finally, in making a decision as whether to activate bilateral controls, the United States would need to make a very important decision, among others, as to whether it would wish to proceed in this fashion unilaterally or whether it would tie its action to a willingness by other suppliers to take a similar action. Unless other suppliers were willing to take similar actions (even if only for a temporary period), it might not be feasible for the United States to reactivate the imposition of bilateral safeguards without jeopardizing its nuclear supply arrangements with consumer nations that might prefer to continue to remain under IAEA controls. To this end if the United States ever elects to activate fall-back bilateral safeguards it would be well advised to hold close consultations with the other interested states with the view of encouraging comparable action by at least some other suppliers.

#### 5.4.3 Concept Of Establishing New Multilateral Safeguards Arrangements

From a theoretical standpoint there are advantages and disadvantages to multilateral as contrasted to bilateral safeguards approaches. Each approach offers some benefits and liabilities and before discussing some more specific institutional possibilities, it may be useful to review the major arguments ventured for and against multinational safeguards approaches.

AC4NC104

Bilateral safeguards would offer some advantages to a supplier state like the United States since, they provide the supplier with the direct opportunity to verify with its own personnel, that the nuclear materials and equipment that it is supplying are not being used for explosive or other military purposes. The supplier sees for himself how his assistance is being employed and does not have to work through international intermediaries or in concert with other nations to make sure that the inspection process is being applied in a rigorous and effective manner.

A multilateral system dilutes the power and influence of any one member state, it can be prone to political factionalism as witnessed some of the developments in Vienna and it is apt to move more slowly and in a more cumbersome manner due to the different cross currents and political influence and interests that have to be accommodated. For this reason, the United States admittedly gave up some independent power and influence when it suspended its bilateral safeguards several years ago in favor of the safeguards being administered by the IAEA. Also, (and at least for the United States) bilateral safeguards would be easier to pursue than turning to some new institutional concept or approaches that might have to be developed from scratch. Thus, if the IAEA system fails, U.S. fall-back rights (with all their practical limitations and problems which have been outlined above) might well have to be the U.S. first line of defense while efforts are made to develop longer range acceptable international solutions.

As we have stressed, however, only some states possess bilateral fall-back rights whereas others do not. Consequently, the use of fall-back safeguards cannot be readily employed by all suppliers as an alternate to IAEA safeguards without substantial

cooperation or renegotiation with the consumer states involved. Unless bilateral safeguards are characterized as only a stop-gap device it seems likely that several consumers will strongly resist a regime that involves their having to submit, concurrently, to several such control arrangements.

Further, from a political standpoint many states are likely to continue to prefer a broad multilateral safeguards system since it gives all of the participants a voice in shaping the structure and direction of that system. As was mentioned at the outset of the report, a broadly based system also is likely to be more credible to a wider variety of states since it presumably will be composed of some nations that are in an adversarial relationship with each other and hence more prone to make sure that safeguards are being applied objectively and effectively.

With these considerations in mind, one might argue that if IAEA system "breaks down" in any generic way, the first objective should be to rebuild a broadly based multilateral system that will preserve the strengths of the IAEA system while eliminating its failing. There are at least two theoretical options that might be considered in this regard, but both present serious problems.

Under the first, an international safeguards system could be reconstituted following the "demise" of the IAEA system, presumably as part of a new Agency that also would try to advance the peaceful uses of atomic energy. However, an effort would be made to try to structure participation so as to reduce the probability that extraneous political issues would be brought into that body. Instead of membership, in essence, being made open to all states that participate in the UN system participation would be

AC4NC104

limited or oriented to nations that have a "serious interest" in nuclear energy. "Serious interest" could be defined as engaged in significant civil nuclear activities and possessing significant nuclear facilities. (This could include engagement in a nuclear power program or at least possession of a significant nuclear research installation.) The effect would be to eliminate from membership those lesser developed nations that have only limited interest in nuclear energy such as in some very limited uses of radioisotopes in agriculture, and medicine. The conceivable virtue of such a scheme would be to limit participation to those nations that have some serious nuclear energy development and/or trade program and thus presumably a keen direct interest in making international safeguards work effectively. The implicit assumption here is that it is the lesser developed countries that are "diluting" the serious nonproliferation purpose of the IAEA by trying to push the Agency unrealistically into becoming more of a technical assistance body than a safeguards-oriented organization. This option also assumes that it is the lesser developed countries who are most disposed to introduce "extraneous political issues" in the workings of the IAEA.

There are several flaws with this conceptual approach that suggest that it may not be worth pursuing. First, it seems inconceivable that any major power, including the United States, would seriously propose a new international agency that would be widely perceived as excluding some of the underprivileged nations in the world from membership. The reactions to such a proposal could be explosive on the grounds that several civil nuclear applications mostly involving radioisotopes are of interest to many nations including those in the developing world. Additionally, even if offered the opportunity for membership, it is highly unlikely that the non-NPT states would accept a membership

in a safeguards-oriented organization from which most of their developing state allies are excluded. Also, this option is based on a somewhat dubious assumption--namely that it is "the developing countries" that are posing the most serious threat to the IAEA safeguard system. In point of fact, some of the principal "problem" countries from the IAEA standpoint have been some of the European member states or some of the more advanced LDC countries like Pakistan and India that sometimes have shown great reluctance to accept new and evolving IAEA safeguards techniques that take into account advances in safeguards thinking and technology.

Second, the establishment of a new international organization with a more restricted membership would run directly counter to long-established U.S. nonproliferation policy which has favored the widest possible global participation in the NPT and the widest possible support of nonproliferation values. The United States has consistently argued that nonproliferation is in the national security interest of all nations regardless of their indigenous involvement in nuclear energy. It would be consistent with this philosophy to now suggest that the working of the international safeguards system should be of no interest or only of limited interest to some nations.

Even if such an organization were proposed and created, it seems highly likely that the only safeguards regime it would be able to agree on, even in the absence of the LDC's with limited safeguards interest, would be one that was considerably weaker than that of the current IAEA system.

Finally, if U.S. withdrawal were the cause of the disintegration of the IAEA, it is unlikely that other countries - who would

probably view U.S. withdrawal as unjustified and willful - would heed a U.S. invitation to create a new organization.

Taken together, these considerations reflect a fact which is often overlooked in assessing safeguards and nonproliferation policy options, and whose importance can hardly be overestimated. This is that the conditions which allowed the creation of the nonproliferation regime as we now know it, including its strong safeguards component, no longer exist, and a comparable regime, if any, could not be established under today's circumstances. In particular, the decline in attractiveness of the nuclear power option, whatever its causes, and the loss of U.S. leadership and status as the principal provider of the materials and technology required to pursue this option have seriously undermined the attractiveness the basic nuclear bargain of controls in exchange for cooperation on which the nonproliferation regime was build.

As a second institutional approach to establishing a new multi-lateral system, it has been suggested sometimes in the past that the IAEA cannot perform an objective and rigorous safeguards function since the Agency also is heavily involved in the "promotion" of nuclear energy, including nuclear power. Instead, it has been suggested that the IAEA inspection function either should be performed by a separate organization or walled off in some way from the Agency's promotional and technical assistance activities. This mode of thinking extrapolates to the IAEA the philosophy that led to the establishment of the NRC in the United States as a separate organization from DOE.

In the course of conducting the study, IEAL has encountered no evidence that the rigor and objectivity of the IAEA safeguards

function has been blunted, or watered down, because of an interest that the Secretariat might have in "promoting", rather than effectively controlling, nuclear energy. While it is true that there are tensions within the Agency due to competing demands that different programs place on the IAEA budget, the safeguards program clearly has commanded a sizeable proportion of the resources and has grown far more rapidly than many other activities. In other words, it has not lacked adequate tangible support due to more compelling budgetary pressures from programs of a "promotional" nature. Also, and perhaps more basically, there has long been a perception in both the IAEA as well as in the United States, that the acceptance of international safeguards is fostered to the extent that the extension of safeguards is associated with the provision by the IAEA of positive benefits and assistance. Accordingly, rather than being a detraction from safeguards the IAEA's "promotional" programs have been viewed as supportive to the acceptance of safeguards. This has been the prevalent view, it appears to have merit, and there seems to be little or no prospect that many IAEA member states would support a proposal that separates the safeguards programs from the rest of the IAEA program.

Such a change would require an amendment to the IAEA Statute which would require the approval of two-thirds of the IAEA member states. It is unlikely that such approval could be obtained.

Having said this, a number of people have expressed concerns that the durability of the IAEA overall, and the safeguards program in particular, may very well depend on the preservation of a suitable balance between the IAEA safeguards and promotional activities and that this, in turn, may well depend on two or three basic variables:

AC4NC104

- Preservation of a constructive U.S. attitude towards the "non-safeguards" aspects of the IAEA program with special emphasis on those programs of nominal interest to the developing countries. (Some people feel the United States could have a more positive attitude in this regard, others feel that the United States has nothing to apologize for in this respect.)
- The allocation of sufficient funds and resources to both the technical assistance as well as the safeguards program.
- A possible new approach to alter over time the IAEA mechanism for financing one or both of these programs.

In a later section of this report we discuss these issues in more detail.



## 6.0 USING REGIONALISM TO HELP SHARE THE SAFEGUARDS WORKLOAD OF THE IAEA

The primary focus of the discussion of regionalism to this point has been on the feasibility and credibility of employing new regional groupings as possible "fall-back" institutions if the IAEA system ever loses complete credibility. In addition to the points addressed above there is another aspect of the merits of possibly promoting "regional" safeguards mechanisms that warrant some discussion. Specifically, in preparing this report, IEAL was asked to consider the question of whether the establishment of new or more active regional inspectorates might contribute to a more effective international safeguards system by helping to ease the operating burden on the central IAEA Secretariat.

Under this conceptual approach a few regional organizations would be established in the next several years with the idea that these regional inspectorates would serve as major local "arms" of the IAEA. The safeguards staff from the IAEA and that appointed by the regional organization would work in a joint collaborative way in performing measurements and inspections according to agreed work plans. including delineations of how much inspection effort might be applied by each organization to a given type of activity. Joint IAEA-regional inspection teams could be appointed to carry out safeguards inspections. The theory behind this conceptual approach and its purported advantages are that by establishing such regimes the burdens and demands on the IAEA Secretariat itself might be lessened in the near term. Also, regional arrangements might help ease tensions between neighbors and, as already discussed, the new inspectorates so formed would serve as "insurance policies" to perform safeguards responsibilities on an interim or permanent basis if the central IAEA system ever failed for any reason.

While it is difficult to be precise in evaluating such an abstract concept it can be argued that, for the reasons just cited, the establishment of additional regional safeguards systems would, in fact, provide the international community with a degree of additive security for the future. In the nearer term, conceivably, regional systems could help reduce the safeguards burden on the IAEA inspectorate and over the longer-term they could be preferable (as a fall-back to IAEA safeguards) to a series of overlapping bilateral controls. As evidenced by the EURATOM/IAEA relationship regional and IAEA safeguards could co-exist in the same jurisdictions whereas the same is not likely to be true for bilateral and IAEA safeguards. On the other hand, there could be some very real limitations and difficulties associated with developing mutually supporting relationships between the IAEA and regional systems. In particular, drawing on the experience of the IAEA - EURATOM relationship:

- If a regional group were conceived as an independent or even semi-independent group in nature it could develop a competitive attitude toward the IAEA inspectorate. As such proponents of a regional system might argue (as EURATOM did in its bilateral agreement with the United States) that in the first instance the regional system should assume the fundamental responsibility for applying safeguards to the activities involved and that the IAEA should limit itself to "auditing" the regional system (through spot checks) to help assure that the regional system appeared to be operating in the manner that had been previously agreed. The IAEA would observe, but would not carry out, field inspections itself or perform its own measurements. If this view prevailed the ability of the IAEA to independently verify the reports and records produced by plant operators would be seriously compromised as would the IAEA's ability

AC4NC104

to form independent judgments based on its own safeguards data. The IAEA's credibility as an independent safeguards organization would become seriously impaired.

- As another consideration, and judging from the experience involving the IAEA and EURATOM - it is quite possible that if a joint IAEA/regional inspection regime were proposed some of the countries being inspected might object to what they perceive to be the imposition of a double system of inspection and controls. They might argue that they should be subjected to only one multilateral safeguards system and not two. In the EURATOM context, countries like Belgium and the FRG have repeatedly expressed concerns about what they perceive to be an onerous duplication in safeguards coverage by the IAEA and EURATOM, notwithstanding the efforts the IAEA and EURATOM inspectorates have made to rationalize their efforts together.

These considerations suggest that if any new regional safeguards systems are established while the IAEA still is operating, they conceivably could impact adversely on the stature and durability of the IAEA system unless it were clear from the outset that the IAEA would have a supervisory role over the regional group and would preserve its own independence to perform its own measurements and associated safeguards activities to independently verify the national data it receives.

However, if the IAEA were to preserve these particular prerogatives then one wonders whether it really would be necessary and desirable to establish a regional scheme unless the objective were political and the likely effect of a regional initiative would be to bring some unsafeguarded facilities in some recalcitrant states into the scope of safeguards coverage.

## 6.1 SOME OVERALL CONCLUSIONS ABOUT ALTERNATE SAFEGUARD "SOLUTIONS" TO THE IAEA

Bilateral safeguards could be applied by a few suppliers like the U.S. that possess such rights but most likely they would be judged by many, if not most, consumers as an unsuitable long-term solution. A new global body as an alternative to the IAEA, in theory, might be the most preferable. However, if it were structured in today's world it might well be dominated by the developing countries to the likely disadvantage of the safeguards program even though there have been several encouraging signs, of late, that many developing countries recognize that they have an important stake in the fostering of non-proliferation objectives.

It is quite possible that if supplier state conclude that they must rely on some alternate safeguards mechanism to the IAEA to police their supply agreements they will pool their resources, and form their own joint inspectorate.

While additional "regional" safeguards regimes beyond EURATOM might have some theoretical appeal as possible fall-back mechanisms to the IAEA or as devices for "sharing" the IAEA safeguards workload, when one considers the practicalities they possess some very decided limitations.

On the positive side, the EURATOM system presumably would remain functional if the IAEA system ever failed and in theory it might be feasible to develop a more comprehensive West European regional system through joint efforts between EURATOM and the OECD. At least conceptually the Treaty of Tlatelolco might serve as the basis for pursuing a regional nuclear safeguards system for Latin America or possibly for all of the non-nuclear weapon states in the Western Hemisphere. However, beyond these already very speculative ideas, everything else becomes very dubious at best.

Serious political tensions in the Middle East, South Asia, and Africa, make it infeasible at present to seriously consider bringing nations like Israel, India, Pakistan, South Africa, the two Koreas or Taiwan under any regional arrangements. Also, as this report has stressed in several places it can be assumed that many members of the IAEA will have little appetite or interest in discussing regional Alternatives to the IAEA unless they share a conviction with the U.S. that the IAEA's days are numbered and that contingency plans have to be developed to deal with this eventuality.

Thus, in the foreseeable future if any new regional initiatives are proposed in the non-proliferation area it would be best to try to defend them in their own right as additively useful confidence building measures rather than as possible "substitutes" for the IAEA. They are not by any means substitutes for the IAEA system and they most likely would be opposed if they were presented and justified as such. At best they would provide services that are supplementary to the IAEA's capabilities, at least for now. However, if they are justified in their own right as potentially useful supplements to the IAEA safeguards regime, problems could arise in delineating the division of work between the regional inspectorates and the IAEA Secretariat and the IAEA's ability to carry out independent measures of verification could be seriously threatened. Also, uneven or asymmetrical situations (as well as charges of favoritism in the application of IAEA controls) could arise if new regional groups were established to carry out a safeguards function in some areas of the world but not in others.

All in all, however, the conclusion drawn from the analysis in this report is not an especially surprising one. Briefly put, there does not appear to be a ready institutional alternative available that would perform the same kinds of functions that the IAEA performs at present. Also, it seems probable that most states will strongly resist exploring alternatives for some time to come.

AC4NC104

These observations suggest that if the IAEA runs into difficulty the clear first preference should be to correct the situation where it is - namely at the IAEA. Failing that there really is no ideal other option.

Bearing in mind that there is no ready alternative to the IAEA available, the U.S. has an obvious interest in assuring that the system remains as technically and politically credible as possible and that there not be a repetition of the atmosphere of political confrontation that appeared to be taking over the Agency a few years ago. To some extent an avoidance of such polarization will depend on a preservation of an appropriate balance between the interests of the industrialized and developing IAEA member states and between the activities in safeguards program and those having more of a technical assistance character. This, in turn, raises another question - namely whether the modalities for financing safeguards as well as technical assistance in the IAEA are adequate or whether some basic modifications in the arrangements appear warranted and are feasible to consider and pursue at this time.

## 7.0 THE FINANCING OF SAFEGUARDS

### 7.1 INTRODUCTION AND BACKGROUND

For several years now the United States has been endeavoring to achieve two basic policy objectives in Vienna relating to the financing of safeguards.

- it has judged it to be critically important that the resources available for safeguards keep pace with the increased demands on the program;
- it has consistently adhered to the principle that the costs of safeguards should be borne by the so-called "regular" or assessed portion of the IAEA budget on the thesis that safeguards serve to enhance the security of all IAEA member states, -- consequently all members should contribute to the costs in a suitable manner.

As an important qualification to this second objective, however, and as shall be explained shortly, the United States also implicitly accepted the principle several years ago, that by and large the demands on the IAEA safeguards program tend to originate primarily from the more industrialized and wealthy member states who also have the greatest interests in nuclear power. Relatedly, it was implicitly recognized that safeguards may be of less

direct relevance to many of the poorer IAEA member states and that it was not inappropriate to shield such poorer countries from the sizeable increases in budget demands for safeguards which were likely to be largely occasioned by only a limited fraction of the IAEA membership. In large part, the U.S. moved toward this orientation to try to head off what promised to be a serious and divisive issue within the Agency.

To elaborate the point more fully, quite a number of years ago a substantial number of the less advanced nations in the IAEA stated to sharply question the considerable increase that was occurring in the IAEA safeguards budget. They argued that the safeguards program was not as relevant to their needs as other IAEA programs -- such as technical assistance -- and they started to move seriously in the direction of opposing the growth in the safeguards program. A serious competitive tension arose within the Agency between those states primarily interested in safeguards and those interested more in assistance type activities. Accordingly, to help achieve some stability it was agreed that a suitable measure had to be devised to defuse and meet the concerns of the poorer nations.

Specifically, after much consideration the Board of Governors devised a special assessment scale for financing safeguards subsequently approval by the General Conference which was designed to essentially freeze at a fixed level, the contributions of the poorer nations to the safeguards budget. The poorer nations were defined as those having a per capita net income that fell below a certain level. The other member states who were wealthier were to make contributions based on a complicated formula essentially related to their UN "base rate of assessment". As a result of this special arrangement, the nuclear weapons



states have paid slightly over half of the total safeguards budget\* and about 30% of the IAEA membership (34 countries) pays over 98%.

It must be stressed that when this special financing approach was first developed it was adopted as a provisional measure since it was felt at the time that there were considerable uncertainties as to what future safeguards costs would be. Moreover, some of the interested IAEA member states felt that, in the ultimate analysis, the burdens for absorbing safeguards costs should be shifted even further to those member states that placed highest demands on the system. The developing countries also had a political incentive to keep the discussion of the mode for financing safeguards subject to periodic review as a way of keeping pressure on the membership to provide comparable resources and a greater security in financing for the IAEA technical assistance program which is funded on a voluntary basis.

The difficulty that materialized, however, was that by agreeing only to a provision formula the Board and General Conference essentially almost insured that the issue of how best to finance safeguards would become a recurrent bone of contention in ensuing years. This has proven to be the case and there has been a recurring and periodic debate on the subject ever since.

---

\*Not counting special grants of supplementary support that also are given to the program by the United States and several other countries.

The most recent version of this special assessment formulation was agreed to in 1980. It called for freezing the assessments of a list of "poorer nations" at their 1976 levels. When this formula was up for consideration for extension in 1983 an extension without change was not acceptable to a number of states, including the United States, because changes in the UN scale of assessments would have resulted in the Byelorussian and Ukrainian Soviet Socialist Republic being added to the "relief list" of poorer nations. Accordingly, at the June 1983 meeting of the IAEA Board of Governors it was agreed, as an interim measures, to maintain for one year the existing list of 34 full contributors. It also was agreed that efforts to find a new formula would continue. In June 1984, the Board extended this understanding for an additional two years. Since the extension runs out in June 1986 the subject of how to approach the issue has become one of central importance in the consultations that have been underway in recent months in the IAEA Board of Governors.

Without dwelling on details, two alternative proposals can be identified:

- . A U.S. favored approach referred to hereafter as the compromise approach that would still provide relief for the poorer countries, but which would increase their safeguards assessment by changing the base year from 1976 to 1984, and which would be subject to adjustment for increases thereafter. Additionally, any state which came off the "relief" list because of a change in its UN Rate of Assessment would have its assessments graduated over a five year period to reach the level of a full payor, so as to minimize any associated financial difficulties. This last concession could be augmented by keeping on the

"relief" list any state now on that list until the United Nations completes its review of the relative abilities of different states to provide financial support.

- . An approach under consideration by at least some developing countries, referred to in the following discussion as the consultative approach, under which nations on the "relief" list would contribute in total 2.5 percent of whatever the safeguards budget was in any particular year so that their individual absolute contributions could go up to reflect inflation as well as real growth in the safeguards budget. It would be up to the members on the relief list to decide how they should divide up the 2.5 percent overall percentage. From an equity standpoint this approach seems preferable than the current formulation since all nations would be obliged to contribute (however small the amounts might be) increased absolute amounts to the safeguards budget as the budget goes up - yet the poorer nations still would have the benefit of only having to pay a small fraction of the costs.

## 7.2 DISCUSSION

### 7.2.1 Postulated U.S. Objectives

In the judgment of this study there should be four basic tests for determining the kind of financing scheme that the United States should favor for the IAEA safeguards system over the next several years. Briefly put, they include the following:

- The United States wishes to be assured that adequate resources will be available on a stable and predictable

basis to support the increased demands that most likely will be placed on the IAEA safeguards system as nuclear power programs around the world increase.

- To the extent feasible, the United States wishes to get past the point where the issue of financing safeguards is one of the more recurrent and acrimonious topics within the IAEA Board of Governors and the General Conference. Relatedly, the United States obviously wishes to avoid a situation where the tensions between financing safeguards and technical assistance grow so severe as to threaten the viability of the IAEA structure. So long as the question of safeguards financing festers as an unresolved issue the "durability" of the IAEA safeguards system is at some risk.
- The United States has an interest in having basic principles of equity apply to whatever scheme evolves. It wishes to preserve an appropriate balance between the principles that IAEA safeguards contribute to the security of all nations and the philosophy that the poorer nations should be provided with some protection against escalating safeguards costs that, by and large, they are not incurring.
- The United States wishes to be assured that any financing approach that it favors will be politically acceptable not only within the IAEA but domestically with the Congress.

While one might judge on the basis of past experience that the Board is likely to continue to equivocate on this issue as it has

in the past by agreeing to some sort of minor short term extension of the current formula, there are signs that some actors in Vienna now may push for a longer term solution.

In addition to the cross currents just noted, the issue is further complicated by the fact that it is difficult to predict precisely as to what the probable demands on the safeguards program will be in the future and what changes may be made in the UN scale of assessments which has served as a basis for developing the current special scale. Working within the framework of the existing special assessment formula, changes in the basic UN scale can be significant in determining whether a state pays in at the "normal" rate or is part of the special "relief" list.

Strong arguments also can continue to be made that no viable scheme can ever be pursued in Vienna without maintaining - through one mechanism or another - an appropriate balance between the budgetary allocations that are made for safeguards and those that demonstrably assist developing countries (voluntary technical assistance activities and those portions of the regular budget of direct value to the LDC's). That is, it can be argued that one will not have a complete picture of how best to resolve the safeguards financing issue without concurrently looking at the issue of how best to finance technical assistance. In this regard, there is no doubt that the expenses for safeguards have been growing at a more rapid rate than those related to technical assistance. The following comparisons are relevant:

- Between 1957 and 1982 the IAEA spent over 213 million for non-safeguards activities;
- Safeguards funds in the same period totalled 147.2 million;

- Over the last ten years, funding for safeguards has increased at twice the rate for technical assistance. Since 1970 the Agency's safeguards budget has increased by a factor of twenty seven. This has represented a substantially greater rate of increase than the allocations for technical assistance during the same period (including case contributions, extrabudgetary contributions, UNDP resources, etc.) which have increased by a factor of sixteen.

On the other hand it can be argued that these gross comparisons really are not too meaningful and that it is erroneous to suggest that the Technical assistance programs (and as a consequence the developing countries) have been unfairly treated. This is due to a variety of factors. First, it can be validly argued that the developing countries not have done as well as they have in the IAEA if not for the safeguards program. This is because the concept of maintaining a "balance" between the agency technical assistance and safeguards program probably has stimulated the granting more amounts to technical assistance than might have been the case if no IAEA safeguards program had existed at all. In this regard, the IAEA technical assistance budget has continued to grow substantially while those for other comparable programs supported to other international organizations have tended to remain stationary or even to contract.

Also the comparison of gross rates of increase between the two programs may not be meaningful since it says little about what the real needs are in the two programs. For example in his book, Fischer enables the point that there are inherent limitations as to how much nuclear assistance several LDC's really can absorb since many cannot yet absorb or economically use nuclear power.

Further the material and manpower needs for the safeguards program can be interally greater than those associated with the technical assistance program since in large part are driven by the size of nuclear power programs in general countries and some of these programs (and their associated fuel cycle activities are still expanding. Indeed, some people believe that the IAEA safeguards only now are really starting to come into their own in a significant way, as additional sizeable fuel cycle facilities come into operation. Nevertheless, a report on the Durability of the IAEA safeguards programs would not be complete without some brief comments on what the future increased demands on the program are likely to be and whether they are likely to be so sizeable as to throw into questions whether sufficient resources can expect to be made available under the current financial modalities or whether some more fundamental shifts in the mode of financial safeguards may have to be made.

It is somewhat speculative as to how rapidly safeguards costs will rise in the future since much will depend on the projected growth of the major nuclear activities under safeguards, the safeguards regimes that would apply, etc.

Two relevant reports that were submitted to the Board of Governors on the subject were GOV/2107 and GOV/INF/429 (including Mod. 1.) dated January 22 and February 21, 1983. These documents show the principal kinds of facilities under IAEA safeguards and the probable financial consequences of manpower increases as well as proposed increases in the use of safeguards equipment.

Three options in terms of increases in staff and equipment are shown in the tables taken from GOV/2107. Under the "middle case" there would be an increase in the number of inspectors and

inspection assistants combined to 30 people in each of the four years -- 1984 to 1987 and to 20 in 1988 -- to fully achieve an inspection effort by the end of 1988. If one assumes this "middle case" program is a reasonable basis for projection increases, the safeguards budget would increase from 34.7 million in 1984 to 41.2 million in 1986 and 46.1 million in 1988. These estimates assume that no fundamental changes in the principles of safeguards implementation will occur. The estimates shown in GOV/INF/429 for increasing available equipment are expected to lead to an increase in the effectiveness of safeguards, but are not expected to lead to any substantial reductions in manpower requirements. While the IAEA Secretariat acknowledges that these projects show a significant increase in safeguards costs in absolute terms it also stresses that in relative terms safeguards are still a bargain to the nuclear industry since they only represent a small fraction of the costs of generating nuclear power.

Nevertheless, it seems clear that further significant expansion in the safeguards budget will occur. Also, more than that, some believe that overtime these figures could increase significantly if the mounting inventories of separated plutonium available to Japan and the European countries (pursuant to already existing reprocessing contracts) encourage these nations to make more moves to fabricate and employ plutonium fuel in light water reactors. To the extent this occurs, the competitive demands of safeguards on the Agency's resources would increase.\* A further

---

\*This scenario assumes that the United States would "tolerate" the recycle of fuels subject to U.S. consent rights in nations with credible non-proliferation credentials like Japan and Euratom but that it might discourage broader use -- especially in nations that have been cause for proliferation concern in the past.



word should be said on this matter to help put this issue in perspective.

At the present time, and as is well known, the breeder programs in a number of the industrialized states in the Free World are slipping significantly in schedule which will put off the time when the prospective loadings for new breeder demonstration reactors will place demands on the accessible supply of separated plutonium. In Japan, the MONJU breeder reactor is under construction and is now scheduled to come into operation around 1994. The schedule for the large Japanese demonstration breeder reactor to follow is up in the air and while a comparative design assessment involving different industrial groups is underway the time scale for the next plant is open to serious question and most likely will slip a number of years. In October of 1985 Japan slipped its proposed schedule for achieving commercialization of the breeder from the year 2010 to 2030 and some people feel even this schedule is optimistic. In Europe, the Super Phenix has just started operation and the German SNR (300) or Kalkar reactor is awaiting licensing. While a European Consortium has decided, at least in principle, to build three large breeder demonstration reactors (to be served by one reprocessing plant) it is unlikely that the construction of more than one new reactor will be initiated within the next three years (the German SNR-II reactor or the French Super Phenix II reactor). Thus, it likely will be well into the next century until a number of new breeders will be built.

At the same time, however, nations like Japan, Spain and Switzerland have contracts to have their spent fuel reprocessed at the La Hague facility in France, and the Thorp facility in the U.K. Since it is costly to store this material and since the

volumes being separated will dwarf nearer term breeder requirements, there is a growing perception that it only is a matter of time until the countries involved who own the separated plutonium will seek to utilize the material to a greater extent in thermal light water reactors.

Electricite de France already is making moves in this direction, a joint Belgian-French MOX fuel fabrication company has been formed and test irradiations of MOX fuels in LWR's have been conducted in the FRG, Belgium, Japan and are in the process in Switzerland.

Major moves in the direction of plutonium recycling in LWR's will increase the likely demands on the IAEA safeguards system as well as national physical security systems and there is an expectation that they could add to the tensions within the IAEA between proposed continuing increases in other programs. However, since many of the recycle programs are still in an experimental stage, some believe this increased usage will evolve gradually and precise estimates of the likely added burdens on the IAEA system are not yet available. Nevertheless increased plutonium usable is anticipated several significant new bulk handling facilities are expected to come on line between now and the year 1995 and the demands on the IAEA safeguards program, in turn can be expected to increase over the next several years.

In this regard the following summary statistics have been provided to us by the IAEA secretariat and the reader's attention also is drawn in the appendices to a paper that Wolfgang Stoll of Alkem presented to the Tenth Annual Symposium of the Uranium Institute from September 3 to 5, 1985.

1. It has been estimated that up to now about 40 tonnes of separated plutonium already has been utilized for peaceful purposes, about seven tonnes of this amount went into critical facilities, several tonnes are in processing facilities or are being stored, and about three tonnes have been incorporated into mixed oxide fuels for recycling.
2. Today four reprocessing plants in non-communist countries are in operation with a total capacity of somewhat less than 1000 tonnes of spent fuel per year, corresponding to about 9 tonnes per year of plutonium. The installation of additional reprocessing is a controversial matter. However, some new plants are planned or already under construction, and one old plant (EUROCHEMIC) is expected to be reopened once again. Accordingly by 1995 it is anticipated that these countries will have reprocessing capacity estimated to be about 3000 tonnes per year in operation. By this same year it is estimated that 111 tonnes of plutonium will have been separated, of which 57.8 tonnes will be in use in FBR's and advanced thermal reactors and 53.2 tonnes will be in storage or in use, or available for use in thermal reactors.
3. Thus significant expansions of plutonium use and commerce are likely to occur especially in the period from 1990 to 1995 as will the burdens on the IAEA secretariat. Between now and that period (1995) two large new reprocessing plants in non-nuclear weapon states are scheduled to come into operation, together with a second (and perhaps a third) automated, high throughput mixed oxide fuel facility, two new breeders (MONJU and the SNR-300) will have come on line, a new 700 MWe advanced thermal reactor

(usual plutonium for half of the core) will be in operation and the use of mixed oxide fuels for thermal recycle in light water reactors also should increase. In 1990 it is estimated that on the order of 200 significant (exceeding .1 kilogram) transfers of separated plutonium will occur in non-nuclear weapon states and by 1995 the IAEA secretariat estimates that the number of significant transfers could double to about 400 per year. In a paper for the Uranium Institute, Stoll of the Federal Republic of Germany anticipates a sizable increase in plutonium usable in LWR's but expects this rise to be gradual rather than sudden.

This growth in usage will require careful monitoring by the U.S. from a number of policy perspectives but from the standpoint of this study the critical variables that will require close monitoring will be whether IAEA technical capabilities and resources will be able to keep pace with the growth and, relatedly, whether the financial modalities that will govern IAEA safeguards will serve to assure that adequate funds will be available to meet the essential safeguards needs.

### 7.3 BRIEF REVIEW OF THE OPTIONS

In light of the information currently in hand, it would appear that the U.S. has available to it five basic tactical and substantive options for assuring that adequate funds are available for dealing with the pressures in the IAEA that may favor a change in the modalities for safeguards financing.

1. The United States could give its full support to the consultative formula which is being explored in the Agency

under which developing countries would modestly increase their contribution, with the idea that this formula would be extended indefinitely.

2. The United States could accept the consultative formula provisionally, but continue to press for ultimate acceptance of the compromise formulation that it has favored which would provide that poorer nations would shift over to full payment responsibilities if their growth income so allowed on a basis allowing them to achieve the status of full payment over a five year transitional period. The United States would propose that this formula be accepted by the Board for an indefinite period.
3. The United States could press for adoption of either of the foregoing approaches but on the assumption that the formulation agreed to would again be subject to review in a defined period. (This period could be long enough to extend through the forthcoming PUNE and next NPT review conference if the objective is to take this subject out of the realm of debate for the next several years. Alternatively, it could be for a relatively short period if this were all the traffic would bear or if the United States had in mind pushing hard for a more fundamental change in the financial structure.
4. The United States could undertake a longer range review and series of consultations aimed at a more fundamental possible revision in the financial approach than those described above that would serve to correlate the assessments for safeguards more closely to the nations

that make the heaviest demands on the system while preserving the concept that all IAEA member nations should contribute something to the costs.

In the near term, it is assumed that only the first three options are likely to be desirable and viable for dealing with the immediate problem. A more radical reform of the financing regime in the immediate fut seems completely impracticable and the need and desirability for such a change has not yet been demonstrated or agreed to. This leaves the fourth major option open for consideration -- namely should the U.S. be prepared to shift to a more radical change in the financing regime -- possibly over a period of a few years -- if no comfortable near term agreement can be achieved on a long-term safeguards financing formula and if it appears that the issue will continue to fester, possibly with serious adverse effects as the time for extending the NPT draws closer.

In the judgment of this report the desirable first course of action that the U.S. should pursue is to support seeking consensus on the formula described above or on the one the U.S. tabled earlier as its recommendation. The objective in this view should be to have one or the other of these formulas approved by the next General Conference with the idea that it would remain in force until a later General Conference sees need to revise it. There is considerable merit to be gained in reaching early agreement on a formulation that hopefully will take the subject of safeguards financing out of the areas of debate at least for the next few years.

If, however, no longer term agreement is achieved in the next year on the basis of either of these approaches (and if the subject is destined to come up for debate once again) in our

view, there might be merit, in inaugurating a fundamental reassessment of the situation to assess whether some more basic changes in the safeguards financing formula should be pursued by the U.S. and stand a chance of being broadly accepted. Factors that might justify a more fundamental shift in the basis for financing safeguards in the IAEA might include the following:

- the prospect that continued debates and differences in this area might lead to sharply polarized differences of view in the Agency as to how many resources should be devoted to safeguards and how many to other programs (i.e. such as technical assistance);
- the related prospect that continued divisiveness in the IAEA over this issue could jeopardize the ability to obtain the requisite funds to finance increased demands on the safeguards program; and
- the prospect that a serious and growing hostility might be engineered against the safeguards program on the part of the poorer, less industrialized nations, who might feel that the "users" of safeguards should clearly pay the major share of the costs.

It is assumed that if developments evolve in this negative manner the U.S. will nevertheless wish to preserve the concept that all members of the IAEA should contribute to safeguards costs since all benefit from the non-proliferation benefits that the system provides.

However, without violating this principle it is believed that some interesting options could be considered that would more

closely correlate the payments that nations make into the safeguards system with the degree to which they place demands on system resources.

In this regard there are at least three options that could be considered if one desired to more closely correlate the level of payments with approximate degree of use of the system.

- Under the first such option, a scheme could be devised to have some "generally" applicable safeguards costs (which could vary from year to year, including general administrative costs and costs of safeguarding research reactors) charged to all members on the basis of the UN scale. All other safeguards costs could be to non-nuclear weapons states as well as the nuclear weapon states on the basis of a special assessment based on installed civil nuclear capacity -- also taking into account bulk handling fuel cycle facilities in the country concerned that call for the application of safeguards.
- Second, as in the situation at present, a special "relief list" based on the UN scale of assessments and fixing the total amount of contributions from the poorer nations could be preserved. This contribution from the LDC's could be a fixed dollar amount per country related to an agreed base year or, preferably, as in the consultative proposal, all of the "poorer" countries could be committed to contribute a fixed model total percentage of what the safeguards costs would be in any particular year. Thus, their absolute contributions, however small could grow with the size of the safeguards budget. However, as in the option just noted, the balance of safeguards costs



(which would be the major fractions of the expenses) could be assessed on the basis of installed nuclear power capacity rather than national income plus an added factor based on the presence of bulk handling facilities. Under these first two options the two lists (poorer nations and countries placing the greatest real demands on the safeguards program) would be reviewed and revised periodically to take into account changing circumstances.

- Third, and as in the first option noted above, some general safeguards costs of wide interest and value to many nations (including administrative costs and the costs of safeguarding research reactors) could be charged based on the UN scale to all members. All other costs would be charged to IAEA member states, both non-nuclear weapon and nuclear weapon states on the basis of full reimbursement of safeguards expenses actually incurred.

We see merit in pursuing the second option noted above since it combines a "relief list" approach that people in the IAEA are accustomed to with an approach that would tie safeguards costs more closely or more explicitly to the nations that are incurring such costs. However, since the use of a "relief list" based on the UN scale tends to create difficulties as changes are made to the basic UN list, the first option noted above also may merit serious attention. It has the virtue of preserving the concept that everyone should contribute to the costs of safeguards and it preserves desired flexibility to have these contributions increase as safeguards costs, themselves increase. However, it also has the virtue of more explicitly elevating the concept that those nations that are likely to make the heavy demands on the IAEA for safeguards services should pay the greatest amounts.

Further quantitative analysis would be required to calculate how this revised approach would affect the payment status of the various IAEA member states as contrasted to the current payment schedule under the existing systems. We would expect there to be good correlation between the current range of assessments, except that some lesser developed nations that have heavy investments in nuclear power might have to pay a greater fraction of the costs than now is the case. Further work would be required to flesh this concept out further.

Regarding the third option, it is doubtful whether a levy or reimbursement system related to actual inspection effort would work since this might significantly reduce the contributions of the nuclear weapon states. For example, in the cases of France and the USSR only very modest if not token, inspections may actually be performed pursuant to the voluntary safeguards offers that these states have in effect with the IAEA. For this reason, it would appear preferable to contrive an arrangement that would allocate safeguards costs based on installed nuclear power but with an added factor introduced to reflect likely expenses to be incurred by the presence of civil nuclear bulk handling facilities.

#### 7.4 COMPETITIVE DEMANDS FOR TECHNICAL ASSISTANCE

As noted earlier, it has become somewhat customary within the IAEA to have nations from the third world complain about the imbalance in the program favoring safeguards over technical assistance. To help counter these complaints, the United States and others have generally adhered to policies that recognize that the viability of obtaining necessary resources for the safeguards program is coupled to providing adequate support to the IAEA

technical assistance program and that serious shortfalls or cutbacks in the amounts available for technical assistance could lead to damaging attacks on the safeguards budget. Accordingly, to provide great predictability as well as necessary increases in the amounts that may have to be made available on a voluntary basis for technical assistance, the IAEA, with U.S. support, has been employing "indicative planning" figures whereby the IAEA Board of Governors and General Conference now agree to targets for the voluntary budget for a three year period. This has facilitated orderly growth in the technical assistance program even though a ceiling has been placed on the regular budget. For example, as we noted earlier the September 1985 General Conference approved indicative planning figures that provide for an annual increase in the voluntary target of 12% per year 1987, 1988 and 1989. However, the Agency's assessed budget has been held to zero growth for 1986 -- which is the portion of the IAEA budget that finances safeguards.

Within this context, some believe that the tensions between the IAEA regular and technical assistance budgets have abated because of the "indicative planning" process and that the matter of financing technical assistance should be a relatively calm subject for discussion over the next several years. The implication is that no fundamental changes need be made in the IAEA modes of financing either safeguards or technical assistance at this time to keep matters from degenerating from a political perspective in Vienna.

On the other hand, there are reasons to believe that the issue of providing additional resources for the developing countries will remain on the IAEA agenda for several years to come and that this could have an on-going indirect affect on the safeguards budget.

These include the following considerations:

- First, it is anticipated that there will be some follow-up in the IAEA to that portion of the Declaration of the 1985 NPT Review Conference that recommended that the IAEA establish "an expert group to study mechanisms to assist developing countries in the promotion of their nuclear power programs, including the establishment of a financial assistance fund". The IAEA Director General, Mr. Blix will shortly convene an expert group to advise him on this subject.

This recommendation evolved at the NPT conference from proposals put forth by Egypt. The Egyptian delegation had urged the establishment of a Financial Assistance Fund to assist developing countries parties to the NPT in the development of their peaceful nuclear power programs, and a mechanism -- complementary to IAEA safeguards -- to provide concessionary soft loans and grants, as well as to facilitate access to commercial financial markets. However, fiscal constraints (in the developed countries) led to a more cautious response to this proposal, and the language just quoted emerged from the Conference. No action on this recommendation was taken at the September 1985 meetings of the IAEA Board of Governors, but Director General Blix called attention to it in his opening address to the IAEA General Conference that started immediately after the close of the Review Conference, and subsequently had some exploratory discussions with the World Bank, which appeared willing to cooperate in such a study. An IAEA expert group to advise Mr. Blix will be meeting shortly to discuss the issue.

- Second, the demands for additional benefits for the LDC's have become so recurrent a phenomena in the IAEA as to take on a strong habitual quality. Since this pattern is of a long standing nature in the IAEA, we would expect it to continue even though (as David Fisher points out in his book) the "bona fide" needs of several LDC's for external nuclear assistance would appear to be limited. (In this regard, although only a few developing countries have been able to utilize nuclear power, it would seem likely that the new upsurge in interest in the United States in possibly developing smaller, prefabricated and passively safe nuclear power plants could conceivably reflect itself in suggestions from some LDC's as well as some vendors that nuclear power could now have the potential for serving many more LDC's if only adequate attractive financing were available.)
  
- Third, as noted earlier, it seems likely that the PUNE Conference will serve as a staging ground for possibly intemperate demands by the LDC's for more resources including additional programs of support for the IAEA. At best, PUNE is likely to urge the IAEA to give greater impetus to a study of the merits of establishing a special financial assistance fund for nuclear power projects or it could criticize the IAEA for not having given greater priority attention to the subject. If the subject becomes acrimonious the atmosphere for financing safeguards could suffer as a consequence.

Having said all these things, it seems somewhat difficult to argue that a fundamental change in the method of financing the IAEA's technical assistance is required to avoid a serious schism

that would threaten the IAEA's very foundations. While it can be expected that there will be continued agitation in favor of more resources for technical assistance a convincing case has not yet been made that a new special fund for the developing countries will be either required or acceptable to many IAEA member states. Neither has the case been made that there is a need to try to amend the IAEA Statute to include technical assistance as part of the assessed budget. It is believed that when it comes to dollars -- the indicative process has helped to diffuse potential efforts to modify the basic mode of financing.

However, in the judgment of the authors of this report there is a problem, (if mainly one of perception) relating to the United States and the developing countries in the IAEA that needs to be corrected if serious resentments are not to reoccur and threaten the preservation of a businesslike attitude in Vienna. This problem is more attitudinal than anything else and it relates to the fact that basically the United States has been perceived in Vienna as primarily interested in the safeguards aspects of the Agency and only distantly interested in the substance and direction of the Agency's programs (both in the voluntary fund and the regular budget) that are of more central interest and concern to the developing countries.

This was not always the case -- especially in the 1960's and early 70's when many of the Agencies' activities -- such as the joint agricultural program and FAO -- attracted more U.S. interest and support. However, as matters have evolved support of the IAEA safeguards program has become the dominant preoccupation of the interested governmental offices in Washington and other aspects of the IAEA program obtain less attention. In part, this

is understandable in light of the overriding importance of non-proliferation. Also, some applications of nuclear energy, such as nuclear power, have had only limited relevance in the developing world. The risk, however, is that a heavy U.S. concentration on safeguards without substantial attention to other programs can be misconstrued as lack of interest in the interests of the developing members of the IAEA and conceivably could lead to serious resentments that could harm the durability of the Agency.

Many within the U.S. Government who are concerned with supporting the IAEA may take issue with this characterization of how the United States now appears to be relative to the IAEA. They can argue appropriately that through the years the U.S. has provided more funds, fellowships, equipment grants, cost free experts, and data in its civil nuclear program than any other IAEA member state and that this is indicative of the fact that the U.S. has related positively to all IAEA programs and not just safeguards. However, based on the long association that the authors of this report have had with the IAEA and its activities it does appear, in our view, that there has been a lessening in the substantive attention that the various agencies in the U.S. Government have devoted over recent years to the non-safeguards aspects of the IAEA's program with the notable exception of the Agency's health and safety program which has received continued interest, support and attention from the NRC, in particular. For example, it does not appear that the Agency's program and budget receives as systematic a review and commentary from the various technical program agencies and offices in Washington as it did several years ago when the USAEC and then ERDA undertook to make sure that all interested agencies, including the Department of Agriculture performed a careful, systematic review of the Agency's program. It is believed that this deficiency, (if felt

AC4NC104

to be valid by the interested U.S. officials) can be remedied by taking more concerted steps to increase the number of personnel in Washington concerned with following IAEA activities and by having the Washington agencies involved give more systematic review and attention to the non-safeguards as well as safeguards related aspects of the program. Indeed, some people believe that more systematic attention could be as valuable as just increasing U.S. funds in support of these efforts.